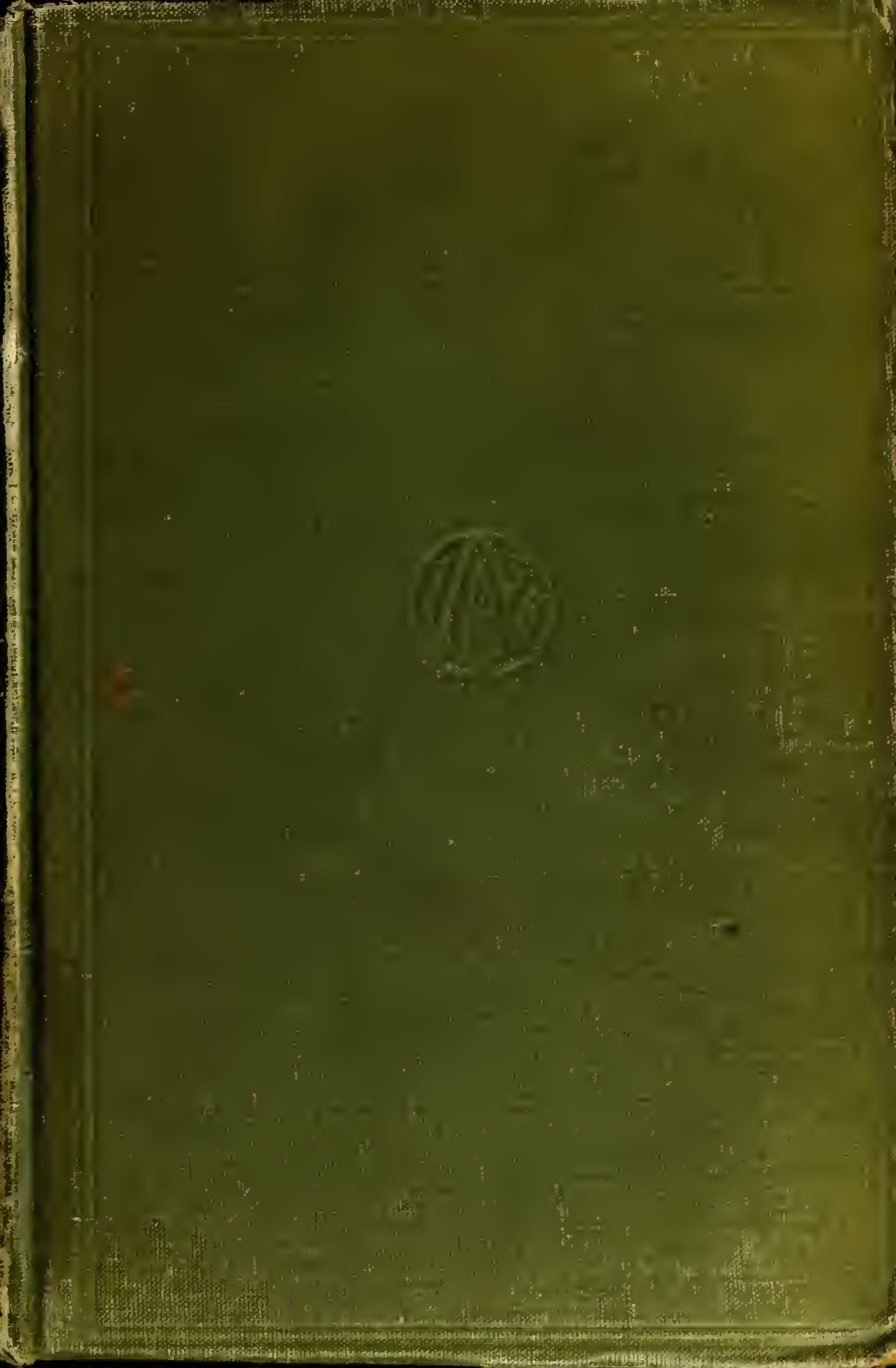
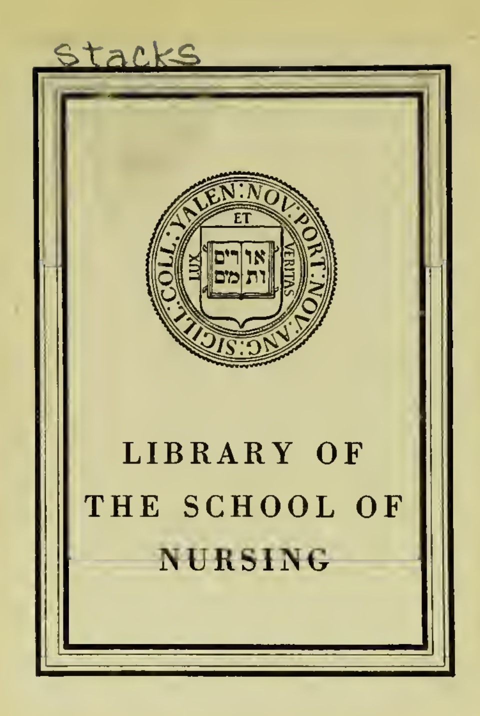



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MANUAL

OF

PSYCHIATRY

EDITED BY

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PREFACE TO THE FIFTH EDITION

In the course of the World War unprecedented opportunities enabled psychiatry to make great strides. The movement for mental hygiene is developing direction, organization, and force. Psychiatrists no longer confine their activities within the walls of institutions for the insane, but are constantly organizing connections with general hospitals, schools, charitable organizations, courts of law, penal institutions, etc.

In the endeavor to keep this Manual abreast of progress and to maintain its usefulness to the student of psychiatry numerous changes and additions have been made in preparing the present edition.

New chapters, sections, or appendices, dealing with the following subjects, have been added: applications of psychology in psychiatry, psychoanalysis, applications of sociology in psychiatry, extramural psychiatry, psychoneuroses, hyperthyroidism, normal course of early mental development, Stanford revision of the Binet-Simon intelligence scale, Kent-Rosanoff association test, standard psychological group tests, and the classification of mental diseases adopted by the American Medico-Psychological Association.

The chapters, sections, or appendices, dealing with the following subjects, have been extensively rewritten: arrests of development, epilepsy, constitutional psychopathic states, chronic alcoholism, cerebro-spinal syphilis, lumbar puncture, and tests of the cerebro-spinal fluid.

The remaining chapters have also undergone careful revision with resulting numerous minor changes and additions.

The Index has been greatly amplified and, it is believed, rendered more serviceable.

Some of the alterations have been made as a result of criticisms and suggestions offered by reviewers, to whom grateful acknowledgment is hereby made.

In order to introduce all the above mentioned changes and additions it proved necessary to reset the entire book. The aim has, however, been adhered to of avoiding its growth beyond the proportions of a practical manual, convenient for frequent reference. By the use of somewhat smaller type and by making the pages a little larger the increase in thickness has been kept down as far as possible, although, of course, it could not be wholly avoided.

This Manual, as many know, first appeared in English in 1905, as a translation of the French *Manuel de Psychiatrie* by J. Rogues de Fursac. The special demands of American students have, through successive editions, led to changes and additions eventually affecting even scope and viewpoint. To-day the original French model still constitutes the nucleus around which this Manual has grown; yet it is but the duty of the American editor to acknowledge his full responsibility for its teachings.

It is the earnest hope of the editor and his collaborators that this Manual will continue to meet a growing demand, as, apparently, it has done in the past.

Aaron J. Rosanoff.

Kings Park, Long Island, N. Y.
January, 1920.

CONTENTS

PAGE

List of Contributors.................................. iii

Preface to the Fifth Edition.......................... v

Introduction.. xiii

PART I—GENERAL PSYCHIATRY

I. Etiology... 1

Essential causes: heredity, addiction to alcohol or drugs, syphilis, head injuries.—Incidental or contributing causes. —Other etiological factors: race, age, sex, environment, occupation, marital condition, education, immigration.

II. Symptomatology...................................... 19

Disorders of perception: insufficiency of perception, illusions, hallucinations; properties common to all hallucinations; the different varieties of hallucinations; theories of hallucinations.

III. Symptomatology (*continued*)....................... 40

Consciousness, memory, attention, association of ideas, judgment: unconsciousness, clouding of consciousness, disorientation, states of obscuration; different forms of amnesia, illusions and hallucinations of memory, pseudo-reminiscences; weakening of attention, flight of ideas, incoherence, imperative ideas, fixed ideas, autochthonous ideas; false interpretations, delusions.

IV. Symptomatology (*concluded*)........................ 61

Affectivity, reactions, personality: morbid indifference, exaggeration of affectivity, morbid depression, anger, and joy; aboulia, automatic reactions, suggestibility, impulsive reactions, stereotypy, negativism, disorders of cœnesthesia, alterations of personality.

PAGE

V. The Practice of Psychiatry........................ 76

History taking: family history, personal history, history of psychosis.—Methods of examination: physical examination, mental examination.

VI. The Practice of Psychiatry (*continued*).............. 88

Special diagnostic procedures: lumbar puncture, Wassermann reaction, chemical tests, intelligence tests, examination for aphasia, association tests, other tests, medical consultations.

VII. The Practice of Psychiatry (*continued*)............. 92

Applications of psychology in psychiatry: mental measurements, normal curves of distribution, group tests, association tests, experimental psychopathology and pharmacopsychology, educational therapeutics, theoretical relations.

VIII. The Practice of Psychiatry (*continued*)............. 101

General therapeutic indications: institution, commitment; treatment of excitement, suicidal tendencies, refusal of food.—Psychotherapy.—Parole and discharge.—After-care.

IX. The Practice of Psychiatry (*continued*)............. 120

Psychoanalysis: realm of the unconscious, sexual theory, psychopathology of everyday life, interpretation of dreams, realistic and autistic thinking, technique of psychoanalysis.

X. The Practice of Psychiatry (*continued*)............. 146

Applications of sociology in psychiatry: interrelation of social and mental disorders, the psychiatric social worker, functions of a sociological department, organization of a sociological department.

XI. The Practice of Psychiatry (*continued*)............. 158

Prognosis.—Prevalence of mental disorders: are they on the increase?

XII. The Practice of Psychiatry (*continued*)............. 165

Prophylaxis in psychiatry: relationship between bad heredity and other causes; prevention of bad heredity; prevention of alcoholism, drug addictions, and syphilis; the individual; immigration.

PAGE

XIII. The Practice of Psychiatry (*continued*)............. 181

Medico-legal questions in psychiatry: commitment; legal competence; testamentary capacity; criminal responsibility; relationship between vice, crime, and mental disorders.

XIV. The Practice of Psychiatry (*concluded*)............. 190

Extramural psychiatry: community surveys, National Army statistics.

PART II. — SPECIAL PSYCHIATRY

Classification.. 193

I. Arrests of Development.......................... 195

Idiocy, imbecility, moronism or feeble-mindedness, borderline conditions.

II. Mental Disorders Associated with Epilepsy....... 205

Permanent disorders; paroxysmal disorders.

III. Constitutional Psychopathic States............... 215

Inadequate personality, paranoid personality, emotional instability, criminalism, pathological lying, sexual psychopathy, nomadism.

IV. Dementia Praecox................................ 229

Symptoms common to all forms; simple form, catatonia, delusional forms, *délire chronique à évolution systématique*; diagnosis, prognosis, etiology, nature, pathological anatomy, treatment.

V. Paranoia.. 262

VI. Manic-Depressive Psychoses...................... 267

Manic types: simple, delusional, confused mania.—Depressed types: simple, delusional, stuporous depression.—Mixed types: mixed type proper, attacks of double form.—Course, prognosis, diagnosis; homogeneity of manic-depressive psychoses; treatment.—Chronic mania.

VII. Involutional Melancholia........................ 292

PAGE

VIII. Psychoneuroses.................................. 300
Hysteria, neurasthenia, psychasthenia.

IX. Huntington's Chorea.................................. 327

X. Acute Alcoholism. Pathological Drunkenness... 331

XI. Chronic Alcoholism.................................. 335
Permanent symptoms: psychic, physical.—Diagnosis, prognosis, pathological anatomy, etiology.—Episodic accidents: delirium tremens, acute hallucinosis, delusional states, polyneuritic psychosis.

XII. Drug Addictions.................................. 355
Etiology, symptoms, course, treatment; cocaine delirium.

XIII. Syphilitic Disorders.................................. 364
Mesoblastic invasion: cerebral syphilis: early involvement, meningitic type, gummatous type, endarteritic type.

XIV. Syphilitic Disorders (*continued*).................. 370
Parenchymatous invasion: general paralysis: prodromal period, essential symptoms, inconstant symptoms, forms, course, prognosis, diagnosis, pathological anatomy, etiology, prevention, treatment.

XV. Syphilitic Disorders (*concluded*).................. 405
Cerebral arteriosclerosis: arterial supply of the brain; systemic symptoms, symptoms common to all forms, symptoms of occlusion of large vessels, disease of the medullary system of terminal arterioles, disease of the cortical system of terminal arterioles; diagnosis, course, prognosis, treatment.

XVI. Traumatic Disorders.................................. 413
Traumatic delirium, traumatic constitution, traumatic epilepsy, traumatic dementia.

XVII. Miscellaneous Groups.................................. 419
Deliria of infectious origin.

XVIII. Miscellaneous Groups (*continued*).................. 422
Psychoses of exhaustion: primary mental confusion; acute delirium.

PAGE

XIX. Miscellaneous Groups (*continued*)........ 429

Psychoses of auto-intoxication: uraemic delirium.

XX. Miscellaneous Groups (*continued*)........ 431

Thyrogenic psychoses: hypothyroidism: myxœdema, cretinism; hyperthyroidism: exophthalmic goiter.

XXI. Miscellaneous Groups (*continued*)........ 437

Mental disorders due to organic cerebral affections: tumors, multiple sclerosis, brain abscess, central neuritis.

XXII. Miscellaneous Groups (*concluded*)........ 443

Senile dementia: general symptomatology, delusional forms, complications, prognosis, diagnosis, treatment.

PART III. APPENDICES DEALING WITH TECHNIQUE OF SPECIAL DIAGNOSTIC PROCEDURES

I. Lumbar Puncture........ 449

Cell count.—Chemical tests: Lange's colloidal gold test, Noguchi's butyric acid test, Ross-Jones ammonium sulphate test, Pandy's phenol test.

II. Wassermann Reaction........ 460

Principle of the Wassermann reaction, preparation of reagents, collection of specimens for examination, technique of the reaction.

III. Examination for Aphasia........ 470

IV. Normal Course of Mental Development from Birth to Third Year........ 474

V. Stanford Revision of Binet-Simon Intelligence Scale........ 476

Materials and equipment; experimental conditions; range and order of testing; scoring and recording; alternative tests; mental age; intelligence quotient; instructions for tests for mental ages from Year III to "Superior Adult."

PAGE

VI. Free Association Test (Kent-Rosanoff)............ 547

Instructions, classification of reactions, norms, frequency tables, appendix to frequency tables.

VII. Standard Psychological Group Tests............... 621

Digit span, logical memory, cancellation, completion, opposites, part-whole, word building.

VIII. Classification of Mental Diseases Adopted by the American Medico-Psychological Association.... 625

Main groups and subdivisions; definitions and explanatory notes.

Index of Authors.................................... 641

Index of Subjects.................................... 647

INTRODUCTION

Psychiatry is that branch of neurology which treats of mental disorders and of the organic changes associated with them.

Mental disorders arrange themselves in two fundamental categories, characterized respectively by *insufficiency* and *perversion* of the psychic faculties.

Insufficiency may be either *congenital* or *acquired.* In the first case it constitutes arrest of development; in the second, psychic paralysis. When the psychic paralysis is temporary, causing a suspension, but not a destruction, of mental activity, it is spoken of as psychic inhibition; on the other hand, when it is permanently established, it constitutes mental deterioration or dementia.

Perversion of the psychic faculties may also be *congenital* or *acquired.* Various terms are applied to its manifestations, depending upon the particular function affected: hallucinations, delusions, morbid impulses, etc.

Mental diseases or *psychoses* are affections in which mental symptoms constitute a prominent feature. They differ from such mental infirmities as idiocy, constitutional psychopathic states and some states of dementia, in that they are expressions of active pathological processes and not of permanent and fixed alterations of the mind.

Psychic infirmity, when not congenital, occurs as the outcome of mental disease. The relation between the two conditions is analogous to that which exists between ankylosis of a joint and the arthritis which produced it; the latter is a disease, the former an infirmity.

Two general terms still remain to be defined: *mental alienation* and *insanity*. Although they are often employed indiscriminately, their meaning is not quite identical.

Etymologically, an alienated (Lat. *alienus*) individual is one who has become "estranged" from himself, who has lost the control of his mental activity, who, in other words, is not responsible for his acts. This definition rests upon the metaphysical conception of a free will and cannot find a place in medical science, which must be based on observation and must adhere to demonstrable facts.

It is better to adopt an essentially practical definition, as has been done by most modern psychiatrists, and to designate by the term mental alienation the entire class of pathological states in which the mental disorders, whatever their nature be otherwise, present an anti-social character. Not every individual suffering from a psychic affection is alienated. This term can be applied only to those who, on account of some mental disease or infirmity, are likely to enter into conflict with society and to find themselves, in consequence, unable to be an integral part of it.

Insanity, as a scientific term, has fallen into disuse and now retains significance mainly as a legal one. Like *lunacy*, it seems destined to become obsolete, for even in law it is not used without stated or implied further specification, such as *incompetence* necessitating the appointment of a committee of person or estate, *irresponsibility* in a criminal action, *limited testamentary capacity*, or *irrational conduct* necessitating commitment to an institution for treatment and custody. Thus, according to the law of the state of New York, an imbecile, epileptic, or senile dement ("dotard") cannot be committed to a state hospital unless he is at the same time insane, i.e., delusional, depressed, excited, or otherwise irrational in conduct; similarly, some cases of hysteria, neurasthenia, cerebral arteriosclerosis, or brain tumor may be declared insane and committed to an institution, and others not, depending on their manifestations from a sociological standpoint.

This Manual is divided into three parts. The first deals with general psychiatry, comprising causes, symptoms, methods of investigation, treatment, and prevention of mental disorders considered independently of the affections in which they are encountered. The second deals with special psychiatry, that is to say, with the various mental affections individually. The third consists of appendices giving technique of special diagnostic procedures.



MANUAL OF PSYCHIATRY

PART I

GENERAL PSYCHIATRY

CHAPTER I

ETIOLOGY

"On studying closely the etiology of mental diseases one soon recognizes the faet that in the great majority of eases the disease is produced—not by a particular or specifie eause, but by a series of unfavorable eonditions whieh first prepare the soil and then, by their simultaneous action, determine the outbreak of insanity." [1]

This was written nearly three-quarters of a century ago. To-day, though this view is still held to a eertain extent, we are nevertheless able to distinguish amongst the many eauses some few that are *essential* from others that are merely *incidental* or *contributing.* In addition there are other factors that have to do with the etiology of mental disorders, especially, race, age, sex, environment, oecupation, marital eondition, edueation, and immigration.

§ 1. Essential Causes

As implied in the term itself, the essential eauses are those in the absence of whieh mental disorders do not oeeur.

[1] Griesinger. *Die Pathologie und Therapie der Geisteskrankheiten.*

Of these by far the most important are *heredity, addiction to alcohol or drugs, syphilis,* and *head injuries.*

Each of these alone may suffice to produce a mental disorder or it may act by rendering the nervous organization so vulnerable that a breakdown occurs at the occasion of some incidental cause which may be in itself quite insignificant but which here comes to play the part of "the last straw that broke the camel's back."

Heredity.—"This term is applied to the fact of recurrence of traits in a number of blood relatives, due to their possession of a common germ-plasm. Hereditary traits are those whose development depends chiefly upon germinal factors, genes, or determiners."[1]

Heredity of a trait is *direct,* when the trait is found in parents and offspring; *atavistic,* when one or more generations are skipped; *collateral,* when the trait is found prevailingly in collateral relatives and not necessarily in the direct line of ancestry.

It is *similar* when the condition present in the patient is the same as that in an ascendant or collateral relative; in the opposite case it is *dissimilar.* The latter form is by no means uncommon: among the ascendants and collateral relatives of psychotic patients are to be found instances not only of similar psychoses, but also of dissimilar ones and of epilepsy, feeble-mindedness, criminality, temperamental abnormalities, sex immorality, and other neuropathic manifestations.

The fact that nervous and mental diseases are often transmitted by heredity was known to Hippocrates and has since his time been amply attested by psychiatric hospital statistics, but the exact conditions under which such transmission occurs have never been fully understood. Especially perplexing has been the seeming irregularity in the working of heredity as presented, on the one hand, in the above-mentioned facts of atavistic and collateral heredity

[1] Definition kindly furnished by Dr. C. B. Davenport, in a personal communication.

and, on the other hand, in the frequent failure of transmission of neuropathic traits. Recent investigations have, however, revealed some data which seem to indicate that some mental disorders are transmitted from parent to offspring in the manner of a trait which is, in the Mendelian sense, recessive to the normal condition.[1]

The bearing of the Mendelian theory seems to be of such importance in this connection that a brief statement of it may not be considered out of place.

The total inheritance of an individual is divisible into unit characters each of which is inherited more or less independently of all the rest and may therefore be studied without reference to other characters.

The inheritance of any such character is believed to be dependent upon the presence in the germ plasm of a unit of substance called a *determiner.*

With reference to any given character the condition in an individual may be *dominant* or *recessive:* the character is dominant when, depending on the presence of its determiner in the germ plasm, it is plainly manifest; and it is recessive when, owing to the lack of its determiner in the germ plasm, it is not present in the individual under consideration.

The dominant and recessive conditions of a character are often designated by the symbols *D* and *R*, respectively.

To make the matter clearer we may take as an example of a Mendelian character the case of eye color.

The brown color is the dominant condition while the blue color is the recessive condition, as has been shown by Davenport.[2] It would seem that the inheritance of brown eyes is due to the presence in the germ plasm of a determiner upon which the formation of brown pigment is the anterior layers of the irides depends.

On the other hand, the inheritance of blue eyes is believed to be due to the lack of the determiner for brown eye pigment in the germ plasm; for the blue color of eyes is due merely to the absence of brown pigment, the effect of blue being produced by the choroid coat shining

[1] H. H. Goddard. *Heredity of Feeble-Mindedness.* Bulletin No. 1, Eugenics Record Office, Cold Spring Harbor, N. Y.—A. J. Rosanoff and Florence I. Orr. *A Study of Heredity in Insanity in the Light of the Mendelian Theory,* Bulletin No. 5.—C. B. Davenport and D. F. Weeks. *A First Study of Inheritance in Epilepsy.* Bulletin No. 4.

[2] Science, N. S., Vol. XXVI, Nov. 1, 1907, pp. 589–592.

through the opalescent but pigment-free anterior layers of the irides in such cases.

It must be borne in mind that as regards the condition of any character every person inherits from two sources, namely, from each parent. Therefore, with reference to any character he may be pure bred or hybrid.

A casc of inheritance of a character from both parents is spoken of as one of *duplex inheritance* and is often designated by the symbol *DD*.

A case of inheritance of a character from only one parent is spoken of as one of *simplex inheritance* and is designated by the symbol *DR*.

A case in which a character is not inherited from either parent, therefore exhibiting the recessive condition, is spoken of as one of *nulliplex inheritance* and is designated by the symbol *RR*.

We are now in a position to estimate the relative number of each type of offspring according to theoretical expectation in the various combinations of mates.

There are but six theoretically possible combinations of mates. Continuing to make use of thc case of eye color as an instance of a Mendelian character, let us consider in turn each theoretical possibility.

1. Both parents blue-eyed (nulliplex): all children will be blue-eyed, as may be represented by the following biological formula:

$$RR \times RR = RR.$$

2. One parent brown-eyed and simplex (that is to say, inheriting the determiner for brown eye pigment from one grandparent only), the other blue-eyed: half the children will be brown-eyed and simplex and the other half blue-eyed:

$$DR \times RR = DR + RR.$$

3. One parent brown-eyed and duplex, the other blue-eyed: all the children will be brown-eyed and simplex:

$$DD \times RR = DR.$$

4. Both parents brown-eyed and simplex: one-fourth of the children will be brown-cyed and duplex, one-half will be brown-eyed and simplex, and the remaining onc-fourth will be blue-cycd (nulliplex):

$$DR \times DR = DD + 2DR + RR.$$

5. Both parents brown-cyed, one duplex the othcr simplex: all the children will be brown-eyed, half duplex and half simplex:

$$DD \times DR = DD + DR.$$

6. Both parents brown-eyed and duplex: all the children will be brown-eyed and duplex:

$$DD \times DD = DD.$$

It will be readily seen from these formulæ that in attempting to predict the proportions of the various types of offspring that may result from a given mating it is necessary to know, not only whether the character is in each parent dominant or recessive, but in the case of the dominant condition also whether it is duplex or simplex.

Turning again to the case of eye color, an individual with blue eyes we know to be nulliplex as he has no brown pigment in his eyes and therefore could not have inherited the determiner for brown eye pigment from either parent. But how are we to judge in the case of a brown-eyed person whether he has inherited the determiner for that character from both parents or only from one? We can judge this only by a study of the ancestry and offspring of the individual.

To put the whole matter in a nutshell, the essential difference between a dominant and a recessive condition of a character is in the fact that in a case of simplex inheritance the dominant condition is plainly manifest while the recessive condition is not apparent and can be known to exist only through a study of ancestry and offspring.

This is important because it constitutes the criterion by which we are able to determine whether any given inherited peculiarity or abnormality is, as compared with the average or normal condition, dominant or recessive.

According to the assumption that most of the inheritable mental disorders, are, like the trait of blue eyes, transmitted in the manner of Mendelian recessives, theoretical expectation would be as follows:

1. Both parents being neuropathic, all children will be neuropathic.

2. One parent being normal but with the neuropathic taint from one grandparent, and the other parent being neuropathic, half the children will be neuropathic and half will be normal, but capable of transmitting the neuropathic make-up to their progeny.

3. One parent being normal and of pure normal ancestry, and the other parent being neuropathic, all the children will be normal but capable of transmitting the neuropathic make-up to their progeny.

4. Both parents being normal, but each with the neuropathic taint from one grandparent, one-fourth of the children will be normal and not capable of transmitting the neuropathic make-up to their

progeny, one-half will be normal but capable of transmitting the neuropathic make-up, and the remaining one-fourth will be neuropathic.

5. Both parents being normal, one of pure normal ancestry and the other with the neuropathic taint from one grandparent, all the children will be normal; half of them will be capable and half not capable of transmitting the neuropathic make-up to their progeny.

6. Both parents being normal and of pure normal ancestry, all the children will be normal and not capable of transmitting the neuropathic make-up to their progeny.

Table 1 (from Rosanoff and Orr, *loc. cit.*) gives actual findings alongside of theoretical expectation, and it will be seen that the correspondence between the two sets of figures is very close.

TABLE 1

Types of Mating.	Number of Matings.	Total Number of Offspring.	Died in Childhood.	Data Unascertained.	Neuropathic Offspring.		Normal Offspring.	
					Actual Findings.	Theoretical Expectation.	Actual Findings.	Theoretical Expectation
1. $RR \times RR = RR$	17	75	11	0	54	64	10	0
2. $DR \times RR = DR + RR$	93	500	66	5	190	214½	239	214½
3. $DD \times RR = DR$	14	61	13	3	0	0	45	45
4. $DR \times DR = DD + 2DR + RR$	62	369	44	3	107	80½	215	241½
5. $DD \times DR = DD + DR$	20	92	12	3	0	0	77	77
6. $DD \times DD = DD$	0	0	0	0	0	0	0	0
Totals	206	1097	146	14	351	359	586	578

The more important mental disorders which are supposed to develop on a hereditary basis are: arrests of development, epileptic psychoses, constitutional psychopathic states, dementia præcox, paranoia, manic-depressive psychoses, involutional melancholia, psychoneuroses, and Huntington's chorea. Of 8700 cases admitted to the New York

state hospitals during the year ending July 30, 1918, 5420, or 62.3%, belonged to these groups.[1]

Alcoholism.—The most trustworthy experimental data that are available, among which may be mentioned those of Schneider,[2] Hellsten,[3] Mayer,[4] Aschaffenburg,[5] Smith,[6] Kürz and Kraepelin,[7] seem to show that even moderate indulgence in alcohol, though producing in the subject a sense of well-being and of increased physical and mental ability, in reality causes impairment of muscular power and coördination and of mental efficiency.

Excessive indulgence produces the sufficiently familiar picture of drunkenness, and such excesses, if frequently repeated, are apt sooner or later to produce one or another of the alcoholic psychoses, of which the more important are: delirium tremens, acute hallucinosis, a fairly characteristic chronic delusional state, the polyneuritic psychosis, and alcoholic dementia. During the year ending June 30, 1918, 7.1% of all male admissions and 2.6% of all female admissions to the New York state hospitals were cases of alcoholic psychoses.[8] This does not include cases which were not specifically alcoholic but in which intemperance was given as a contributing cause.

[1] Thirtieth Annual Report of the State Hospital Commission, Albany, N. Y., 1919.

[2] Pflueger's Archiv. f. d. gesamte Physiologie, Vol. XCIII, p. 451.

[3] Abstracted in Muenchener medicinische Wochenschrift, 1904, p. 1894.

[4] M. Mayer. *Ueber die Beeinflussung der Schrift durch den Alkohol.* Kraepelin's Psychol. Arb., Vol. III, p. 535.

[5] G. Aschaffenburg. *Proktische Arbeit unter Alkoholwirkung.* Kraepelin's Psychol. Arb., Vol. I, p. 608.

[6] A. Smith. *Ueber die Beeinflussung einfocher psychischer Vorgänge durch chronische Alkoholvergiftung.* Br. ueber d. V. intern. Kongr. z. Bekämpf. d. Missbr. geist. Getränke, Basel, 1896, p. 341.

[7] Kürz and Kraepelin. *Ueber die Beeinflussung psychischer Vorgänge durch regelmässigen Alkoholismus.* Kraepelin's Psychol. Arb., Vol. III, p. 417.

[8] Thirtieth Annual Report of the State Hospital Commission, Albany, N. Y., 1919.

Drug Addictions.—In March, 1918, a special committee was appointed by the Secretary of the Treasury of the United States to investigate the traffic in narcotic drugs. This committee rendered an official report of its investigation in June, 1919. The report states that the per capita consumption of opium in the United States amounts to 36 grains annually, the consumption in some other countries being as follows: Austria $\frac{1}{2}$ to $\frac{3}{5}$ grain; Italy 1 grain; Germany 2 grains; Portugal $2\frac{1}{2}$ grains; France 3 grains; Holland $3\frac{1}{2}$ grains. "When it is considered that the greater portion of our citizens do not take a single dose of opium year after year, it is manifest that this enormous per capita consumption is the result of its use for the satisfaction of addiction."

The situation as regards cocaine is somewhat similar: "112,500 ounces of cocaine, which is manufactured in this country, is used for illicit purposes, and this does not include that quantity which is smuggled into this country, of which no estimate can be made."

"The committee is of the opinion that the total number of addicts in this country probably exceeds 1,000,000 at the present time."

Hundreds of cases came to light in drafted men between the ages of 21 and 31 in the National Army cantonments. The drugs used in 100 consecutive cases observed in the Base Hospital at Camp Upton, N. Y., were as follows:

TABLE 2

Drug	Cases
Heroin	84 cases
Morphine and heroin	5 "
Morphine	4 "
Opium and heroin	2 "
Cocaine, morphine and heroin	2 "
Cocaine and heroin	1 case
Morphine, opium and heroin	1 "
Opium and morphine	1 "

Syphilis.—Syphilis appears as the essential cause of all cases of general paralysis and of cerebral syphilis (gummata, meningitides, etc.), and of a large proportion of the cases of

cerebral arteriosclerosis. Not counting cases of the latter condition, which are not always of syphilitic origin, 21.2% of all male first admissions and 6.5% of all female first admissions to the New York state hospitals during the year ending June 30, 1918, occurred on the basis of syphilis as an essential cause.[1]

Head Injuries.—The more important mental disorders occurring as result of head injuries are: traumatic delirium, traumatic constitution, traumatic epilepsy, and traumatic dementia. These cases are far more often brought to general hospitals than to hospitals for the insane for reasons that are sufficiently obvious. Thus only 0.3% of all first admissions to the New York state hospitals during the year ending June 30, 1917, were cases of traumatic psychoses.[1]

§ 2. Incidental or Contributing Causes

The incidental or contributing causes are remarkable for their multiplicity and complexity; one might almost say that they are as many as there are individual cases and that in no two cases is their manner of action exactly alike. In themselves, however, they do not suffice to produce a mental disorder, but acquire pathogenicity only in the presence of an essential cause.

Some are met with in practice with special frequency and therefore seem to possess quasi-specific potency in the production of mental disorders.

Alcoholism, which has been already mentioned as an essential cause, may also act as a contributing cause in the presence of a predisposition created by one of the other essential causes. Thus, acting on a basis of bad heredity, alcoholism may determine the development of dementia præcox or of a manic-depressive or an epileptic attack; and some hold that a syphilitic subject who is also intem-

[1] Thirtieth Annual Report of the State Hospital Commission, Albany, N. Y., 1919.

perate is more likely to develop general paralysis than one who is abstinent. Thus, of the 16.2% of first admissions to the New York state hospitals during the year ending June 30, 1918, in which there was a record of intemperance, only 5.2% were cases of specifically alcoholic psychoses, the remaining 11.0% being cases in which alcoholism played the part merely of a contributing cause.[1]

Head injuries, like alcoholism, are probably capable of acting not only as essential but also as contributing causes, especially as factors in the etiology of general paralysis; their importance in this connection will be again discussed in the chapter devoted to this disease.

For the rest, recent studies seem to indicate that the incidental or contributing causes that are met with are *psychic* rather than *physical* in their nature or manner of operation.[2]

Even such causes as *pregnancy, abortion, childbirth,* and *lactation* are found in the better analyzed cases to act not as physical causes, but through psychic accompaniments, such as illegitimacy, increasingly hopeless domestic infelicity, apprehension of added hardships; although it is undoubtedly also true that such conditions as febrile or exhaustion deliria may be produced by these causes acting in a physical way, especially in the presence of complications like excessive hemorrhage or infection.

Among the plainly psychic causes may be mentioned the following as being the more common: *Business troubles*: financial difficulties, loss of employment, inability to get employment, failure in school examinations. *Domestic*

[1] Thirtieth Annual Report of the N. Y. State Hospital Commission Albany, 1919.

[2] Adolf Meyer. *The Role of the Mental Factors in Psychiatry.* N. Y. State Hosp. Bulletin, N. S., Vol. I, 1908, p. 262.—Jung. *The Psychology of Dementia Præcox.* English translation by Peterson and Brill, New York, 1909.—A. J. Rosanoff. *Exciting Causes in Psychiatry.* Amer. Journ. of Insanity, Vol. LXIX, 1912, p. 351.—August Hoch. *Precipitating Mental Causes in Dementia Præcox.* Amer. Journ. of Insanity, Vol. LXX, 1914, p. 637.

troubles: abuse by husband, infidelity of husband, intemperance of husband, desertion, other conditions of marital infelicity. *Love affairs:* disappointment in love, unrequited love. *Death or illness of relatives.*

The relative parts played by the essential and incidental or contributing causes are not the same in all cases.

In such conditions as *arrests of development*, *epilepsy*, marked *constitutional psychopathic states*, and *Huntington's chorea* bad heredity alone suffices to produce the infirmity and to render it manifest.

In the *constitutional psychoses*, too, the factor of bad heredity seems often to be the all important one. "In more than half of the cases indications for commitment have arisen in the midst of an average environment and in the absence of occasion of special difficulty or strain." [1] "On the whole exogenous factors appear to be of but minor importance: the amount of psychotic manifestation is, for the most part, like its kind, predetermined in the germ plasm." [2] It is a remarkable fact, significant in this connection, that the World War produced no increase in the insanity rate, as judged by numbers of cases admitted to institutions.[3]

In the *psychoneuroses* environmental factors often determine the manifestations; i.e., while here, too, the disorder cannot arise in the absence of the constitutional factor, that factor alone, in a large proportion of the cases, produces no manifestations, but remains latent until some external cause brings it to light. This accounts for the vast numbers

[1] A. J. Rosanoff. *Exciting Causes in Psychiatry.* Amer. Journ. of Insanity, Oct., 1912.

[2] A. J. Rosanoff. *Dissimilar Heredity in Mental Disease.* Amer. Journ. of Insanity, July, 1913.

[3] Board of Control, Great Britain. *Insanity and the War.* Third Annual Report, 1916.—R. H. Steen. *Fifty-first Annual Report.* London Asylum and Hospital for Mental Diseases, 1916.—K. Birnbaum. *Kriegsneurosen und -psychosen auf Grund der gegenwärtigen Kriegsbeobachtungen; erste Zusammenstellung vom Kriegsbeginn bis Mitte März,* 1915. Zeitschr. f. d. gesamte Neurologie u. Psychiatrie, 1915.

of psychoneuroses observed in all armies during the World War.

§ 3. Other Etiological Factors

Race.—An excellent opportunity of investigating the influence of race on the occurrence of mental disorders is afforded by the experience of the hospitals for the insane serving the city of New York, where people of various races are living under approximately similar conditions. This opportunity has been well utilized in a study by Kirby.[1] Table 3, compiled from the figures furnished in that study, shows the relative frequency of certain psychoses in people of different races, given in figures representing percentages of the total number of admissions for each race to the Manhattan State Hospital, on Ward's Island, during the year ending September 30, 1908. It will be observed that the Irish are most liable to alcoholic psychoses, while the Jews are practically free from them; the latter, on the other hand, suffer most from the constitutional psychoses, especially dementia præcox and manic-depressive psychoses. The negroes are most liable to general paralysis.

TABLE 3

Psychoses.	Irish.	Jewish.	German.	United States.	Italian.	Negro.
	%	%	%	%	%	%
Senile psychoses	9.80	2.87	6.70	7.14	3.70	9.80
General paralysis	7.59	14.05	20.10	17.46	9.87	29.41
Alcoholic psychoses	27.69	0.32	11.85	11.90	8.64	7.82
Dementia præcox	13.48	27.47	14.95	16.66	23.44	13.72
Manic-depressive psychoses	16.66	28.43	12.89	18.25	13.58	9.80
Epileptic psychoses	2.20	1.59	4.64	3.17	4.93	3.92
Other psychoses	22.58	25.27	28.87	25.42	35.84	25.53
Total number of each race	408	313	194	126	81	51

[1] Geo. H. Kirby. *A Study in Race Psychopathology.* N. Y. State Hosp. Bulletin, N. S., Vol. I, 1909, p. 663.

General paralysis is said to be rare in Arabs and African negroes, although syphilis is common. This, however, is hardly more than a mere impression, satisfactory statistical data pertaining to this subject being as yet not available.

Age.—All ages do not equally predispose to mental disorders. In general it appears that the incidence of the psychoses, as indicated by state hospital admissions, increases sharply with advancing age. This is shown in Table 4, which is based on statistics of population given in the Thirteenth Census of the United States and on those of hospital admissions furnished by the New York State Hospital Commission.[1]

TABLE 4

Age Groups.	Population, 1910.	First Admissions to the State Hospitals.	Admissions per 100,000 of Population.
Under 15 years	2,459,923	14	0.6
15 to 19 "	831,884	282	33.9
20 to 24 "	920,433	607	65.9
25 to 29 "	857,801	675	78.7
30 to 34 "	750,725	647	86.2
35 to 39 "	696,837	625	89.7
40 to 44 "	589,428	599	101.6
45 to 49 "	495,849	497	100.2
50 to 54 "	412,759	444	107.6
55 to 59 "	290,795	322	110.7
60 to 64 "	235,307	251	106.7
65 years and over	414,336	666	160.7
All ages *	8,966,842	5660	63.1

* Including those of unknown age.

The ages of greatest susceptibility are not the same for all psychoses. Senile dementia seldom if ever occurs before the age of 60. Similarly, involutional melancholia is rarely seen before the age of 40. More than half of all

[1] Twenty-third Annual Report, Albany, N. Y., 1912.

cases of general paralysis are seen between the ages of 35 and 50. The onset of more than half of all cases of dementia præcox and manic-depressive psychoses is before the age of 30. More detailed considerations of age are given in the chapters devoted to the various psychoses.

Sex.—Mental disorders are more frequent in the male than in the female sex. Thus an enumeration of patients in institutions for the insane made on January 1, 1910, showed for the entire United States an average of 208.5 men and only 199.6 women per 100,000 of the general population. An even greater contrast was presented by the admissions to the institutions during the year 1910, which were 72.1 men and 59.7 women per 100,000 of the general population. This difference seems to be due entirely to the greater frequency of general paralysis and of alcoholic psychoses among men, the admissions for all psychoses other than these being about the same for the two sexes, averaging 54.4 men and 55.6 women per 100,000 of the general population.[1]

Environment.—Statistics show almost invariably that urban populations contribute relatively much greater numbers of admissions to institutions for the insane than do rural ones. Thus during the year 1910 the urban population[2] of the United States contributed 102.8 admissions, and the rural population but 41.4 per 100,000.[1] This difference can be partly accounted for by the greater prevalence of alcoholism and syphilis in urban populations. Another factor having a bearing here is the difference between the two portions of the population in age distribution: only 27.2% of the urban population and as many as 36.3% of the rural population were under 15 years of age; we have

[1] *Insane and Feeble-Minded in Institutions.* Bureau of the Census, Washington, 1914.

[2] The expression "urban population" is here used, as in the U. S. Census, to designate all that part of the population which resides in cities, towns, or other incorporated places of 2500 inhabitants or more.

already shown that the population groups under 15 years of age contribute but a very minute proportion of admissions to institutions for the insane.

For the rest, it seems probable that the difference between urban and rural populations, as shown in statistics, is due not to a corresponding difference in incidence of mental disorders, but to purely extraneous conditions, especially accessibility of institutions.[1]

Occupation.—It is hardly to be doubted that occupation has an influence on the incidence of mental disorders, although satisfactory statistics pertaining to this matter are not available. Bartenders, brewery and distillery employees, and hotel waiters are more liable than most others to alcoholic psychoses; soldiers, sailors, traveling salesmen and railroad employees are more liable to general paralysis. Physicians, engineers, architects, clergymen, and lawyers would probably show a relatively low incidence of the graver constitutional psychoses.

Marital Condition.—Of all patients admitted to the institutions for the insane in the United States during the year 1910, 48.4% among men and 33.4% among women were single. In the adult population at large only 38.7% of the men and 29.7% of the women were single—this in spite of the fact that the average age of patients admitted is higher than that of the general adult population (over 15 years of age) and that, on that score, the percentage of single persons should be less and not greater among the hospital admissions. This, however, "is not to be interpreted as indicating that the single are more liable to become insane than the married. It means rather that the insane as compared with the normal are less likely to marry." [2]

An interesting relationship is also to be observed between certain psychoses and the state of widowhood, divorces and

[1] A. J. Rosanoff. *A Study of Eugenic Forces.* Amer. Journ. of Insanity, Vol. LXXII, 1915.

[2] *Insane and Feeble-Minded in Institutions.* Bureau of the Census, Washington, 1914.

separations. Table 5, copied from statistics furnished by the New York State Hospital Commission,[1] shows that the percentages of the widowed, divorced, and separated were highest in the general paralysis and alcoholic groups; the table also shows that the groups of constitutional psychoses have the highest percentages of single persons.

TABLE 5

Psychoses.	Per cent of Total of Each Psychosis.					
	Single.		Widowed.		Divorced and Separated.	
	Males.	Fem.	Males.	Fem.	Males.	Fem.
General paralysis	26.0	14.8	5.5	21.3	6.7	5.5
Alcoholic psychoses	39.5	11.9	9.8	23.1	6.6	9.7
Dementia præcox	81.4	58.0	2.0	6.6	2.2	3.3
Manic-depr. psychoses	60.1	41.3	4.5	9.2	2.1	3.1

Education.—That the factor of education is in some manner related to the incidence of mental disorders is uniformly indicated by statistics representing the experience of every state in the country. Thus on January, 1, 1910, there were 881.8 persons in institutions for the insane per 100,000 of the white illiterate population 10 years of age or over in the United States and only 225.8 per 100,000 of the literate population. The constitutional psychoses, far more than others, contribute to this showing.

The conclusion could hardly be drawn from this that illiteracy is to any great extent a cause of mental disease, rather the reverse being true for the most part: the clinical histories of the illiterate insane show that most of them had been unable to learn to read and write owing to inherent mental defectiveness.

[1] Twenty-fifth Annual Report, Albany, N. Y., 1914.

Immigration.—Immigration in relation to insanity presents in this country a problem of great magnitude. Of all the insane in institutions in the United States according to the enumeration of the Thirteenth Census 29.3% were foreign born; of the native insane 30.7% were of foreign or mixed parentage. The figures given for the state of New York are even more striking: 41.4% were foreign born; of the native insane 51.0% were of foreign or mixed parentage.

Furthermore it has been shown that during the year ending September 30, 1911, the native population of the state of New York furnished 46.4 first admissions per 100,000 to the state hospitals, while the foreign born population furnished 100.3—relatively 2.19 times as many.[1]

This raises the important question whether the incidence of insanity is really greater among the immigrant races than in the older white population in this country or whether some other conditions are responsible for this showing.

A study of the available statistics has shown that the difference in age distribution which exists between the native and foreign-born parts of the population accounts largely, but not wholly, for the difference in the proportion of insane hospital admissions.

The difference is further, but still not wholly, accounted for by the greater proportion of town dwellers among the foreign-born than among the native population.

Upon eliminating the errors resulting from these disturbing factors there remains but a slight difference between the native and foreign-born parts of the population in the incidence of certified insanity.

It is thought that this remaining slight difference may be accounted for by the heavy stress entailed in the migration and in the subsequent process of adjustment to new conditions and more exacting standards of living, and, possibly, by other, less obvious, disturbing factors.

[1] H. M. Pollock. *A Statistical Study of the Foreign-Born Insane in the N. Y. State Hospitals.* N. Y. State Hosp. Bulletin, April, 1912.

Incidentally, it was shown that the migration of native American masses of population from the eastern to the western coast has produced a similar effect in creating a seeming increase in the incidence of certified insanity; natives of the state of New York who have emigrated to California have contributed proportionately 2.60 times as many admissions to the state hospitals there as the native Californians, a showing even more unfavorable than that made by the foreign-born population in the state of New York.

Owing to the practical impossibility of eliminating all sources of error in a direct comparison of the insanity rates in the native and foreign-born parts of the population, an attempt was made to make the comparison by an indireet method.

Insanity being in large measure transmissible by heredity, any real difference in its incidence which may exist between the native and foreign-born parts of the population should be as patent in the offspring as in the parents; in other words, it should be as evident between native persons of native parentage and native persons of foreign parentage as it is between the native and foreign-born themselves.

Calculation shows that in the state of New York in the fiscal year ending September 30, 1911, the native of native parentage contributed 34.6 first admissions to the state hospitals per 100,000 of their general population, while the native of foreign parentage contributed 34.9—praetically the same proportion.[1]

The conclusion may, therefore, be drawn that there is no evidence to show that there is a greater proneness toward mental disease in the foreign-born than in the native population and that the excessive proportion of hospital admissions furnished by the foreign-born is due to other causes.

[1] A. J. Rosanoff. *Some Neglected Phases of Immigration in Relation to Insanity.* Amer. Journ. of Insanity, Vol. LXXII, 1915.

CHAPTER II

SYMPTOMATOLOGY—DISORDERS OF PERCEPTION

INSUFFICIENCY OF PERCEPTION—ILLUSIONS—HALLUCINATIONS

"The senses," says Johannes Mueller, "inform us of the various conditions of our body by the special sensations transmitted through the sensory nerves. They also enable us to recognize the qualities and the changes of the bodies which surround us, in so far as these determine the particular state of the nerves." [1] The senses, in other words, are the means through which we obtain the knowledge of our own bodies and of the external world.

For the exercise of their function are necessary: (1) the reception of an internal or an external impression by a peripheral organ; (2) the transmission of this impression to the brain; (3) its elaboration in the brain, which transforms it into a phenomenon of consciousness: first sensation, then perception. Only the latter operation is of interest to the psychiatrist.

We shall study successively:

I. Insufficiency of perception;

II. Illusions (inaccurate perceptions);

III. Hallucinations (imaginary perceptions). Hallucinations and illusions are often classed together under the name of *psychosensory disorders*.

§ 1. Insufficiency of Perception

Insufficiency of perception in its slightest degree may be met with in states of depression, at the onset of con-

[1] Johannes Mueller. *Handbuch der Physiologie.*

fusional states, etc. All external impressions are vague, uncertain, and strange. The patients complain that everything has changed in them and around them: objects and persons have no more their usual aspect; the sound of their own voice startles them.

In a more marked degree of insufficiency external impressions no longer convey to the mind of the subject any clear or precise idea; questions are either not understood at all, or understood only when they are very simple, brief, energetically put, and repeated several times. External stimulation, even the strongest, is but vaguely perceived and often causes no reaction proportionate to its intensity or appropriate to its nature.

Finally, complete paralysis of one or several forms of psychosensory activity is observed in connection with profound disorders of consciousness, as in mental confusion of the stuporous form.

Insufficiency of perception constitutes an important element of clouding of consciousness, which will be considered later on.

Its pathogenesis is closely connected with disorders of ideation. The normal act of perception really consists of two elements: (1) a sensory impression; (2) a series of associations of ideas which enables the mind to recognize the impression and which almost always completes it and renders it more definite. If the associations of ideas are not formed in sufficient numbers the perception can only be vague and ill defined.

§ 2. Illusions (Inaccurate Perceptions)

An *illusion* may be defined as a perception which alters the qualities of the object perceived and presents it to consciousness in a form other than its real one. One who hears insulting words in the singing of birds or in the noise of carriage-wheels experiences an illusion.

Illusions are of frequent occurrence in normal persons.

There is no one to whom the folds of a curtain seen in the dark have not appeared to assume more or less fantastic shapes. But the mind, aided by the testimony of the other senses, recognizes the abnormal character of the image; the illusion is recognized as such. In psychotic cases it is on the contrary taken for an exact perception and exercises a more or less marked influence upon all the psychic functions.

Illusions may affect any of the senses and present, in the case of each, features analogous to those of hallucinations; we shall therefore not describe them here. We shall say but a few words concerning illusions of sight which present certain peculiarities.

Illusions of sight may occur in most of the psychoses, but are chiefly found in the toxic psychoses and in the infectious deliria. When these illusions pertain to persons they lead to mistakes of identity. Many psychotics mistake fellow patients or employees of the institution for relatives or friends. This form of illusion sometimes attains such completeness that the subject may, while at a hospital, believe himself to be at his home.

Illusions are very apt to occur in the midst of vague impressions: those of hearing in the presence of confusing noises, and those of sight in partial darkness.

Like incomplete perceptions, inaccurate perceptions or illusions are the consequence of a disorder of ideation; abnormal associations replace normal ones, which are absent, and complete the image, altering it at the same time.

§ 3. Hallucinations (Imaginary Perceptions)

"A person who has an inmost conviction of a sensation actually perceived, when no external object capable of exciting such sensation is within reach of the senses, is in a state of hallucination" (Esquirol).

"By hallucinations are understood subjective sensory

images which are projected outwardly and which in that way acquire objectivity and reality" (Griesinger).

"A hallucination is a perception without an object" (Ball).

These three definitions are essentially identical. That of Ball appears to us to be the best on account of its conciseness.

Hallucinations may affect any of the senses. There are therefore as many varieties of hallucinations as there are senses.

Some properties are common to all varieties of hallucinations, others are peculiar to certain varieties.

A. PROPERTIES COMMON TO ALL VARIETIES OF HALLUCINATIONS

Hallucinations exercise an influence upon the general psychic condition of the patient, which varies with the subject, the nature of the disease, and the different stages of the same disease.

In a general way it may be stated that the more acute the character of the mental disorder (acute psychoses, periods of exacerbation in chronic psychoses) and the less enfeebled the intellectual activity, the more marked is the influence of the hallucinations. In accordance with this rule, the correctness of which is clinically demonstrated, hallucinations abate in their influence as the acute stage of the psychosis subsides—either when the patient enters upon convalescence, or when he lapses into dementia; under such conditions they may persist for a greater or lesser length of time without exercising any influence upon the patient's emotions or actions.

Influence of Hallucinations upon the Psychic Functions.—*Attention.*—Hallucinations force themselves upon the attention of the patient. In the case of hallucinations of hearing, for instance, he is compelled to listen to them, sometimes in spite of himself, no matter what their degree

of clearness is—whether they consist of distinctly spoken words or phrases, or of a scarcely perceptible murmur.

The patient is sometimes conscious of the tyrannical dominating power to which he is subjected. " I am forced to listen to them," said one of these unfortunates; " when they (his persecutors) get at me I can do no work, cannot follow any conversation, *I am wholly in their power*." Hallucinations thus resemble imperative ideas and autochthonous ideas which we shall study later on.

Judgment.—Hallucinations may coexist with sound judgment and be recognized by the patient as a pathological phenomenon. They are then called *conscious hallucinations*. Such instances are not very rare and consist chiefly of hallucinations of sight. A celebrated case is that of Nicolai, the bookseller. " The visions began in 1791, after an omission of a bloodletting and an application of leeches which he underwent habitually for hemorrhoids. All of a sudden, following a strong emotion, he saw before him the form of a dead person, and on the same day diverse other figures passed before his eyes. This repeated itself on numerous occasions.

" The visions were involuntary and he was unable to form an image of any person at will. Most of the time, also, the phantoms were those of persons unknown to him. They appeared during the day as well as during the night, assuming the colors of the natural objects, though they were somewhat paler. After a few days they began also to speak. One month after the onset of this affection, leeches were applied; on the same day the figures became more hazy and less mobile. They disappeared finally after Nicolai had for some time seen only certain portions of some of them." [1]

Some individuals possess the power of producing hallucinations at will. Goethe had that power. " As I shut my eyes," he said, " and lower my head I figure to myself a flower in the center of my visual organ; this flower does

[1] Johannes Mueller. *Loc. cit.*

not retain for an instant its original form; it forthwith rearranges itself and from its interior appear other flowers with multicolored or sometimes green petals; they are not natural flowers, but fantastic, though regular, figures like the rosettes of the sculptors. It is impossible for me to fix the creation, *but it lasts as long as I desire without increasing or diminishing*." [1]

In the great majority of cases the judgment, itself disordered, is unable to correct the psychosensory error: *the hallucination is taken for a true perception.* Though sometimes in the beginning of the disease the subject experiences some doubts, this transitory incertitude is soon replaced by a blind belief in the imaginary perception. "We observe," says Wernicke, "that the reality of a hallucination is maintained against the testimony of all the other senses, and that the patient resorts to the most fantastic explanations, rather than admit any doubt as to the reality of his perception." [2] An individual, alone in the open field, hears a voice calling him a thief. He will invent the most absurd hypotheses rather than believe himself a victim of a pathological disorder.

Certain patients, chiefly the feeble-minded and the demented, accept their hallucinations without inquiring as to their origin or mechanism; others on the contrary strive to give explanations which vary with the nature of the malady, the degree of the patient's education and intelligence, and the current ideas of the times. In the middle ages psychosensory disorders were often attributed to diabolic intervention, and this not only by patients but also by their friends. Patients of our own times mostly resort for explanations to the great modern inventions (electric currents, telephone, X-rays, wireless, etc.). Some fancy to themselves apparatus or imaginary forces. One patient attributed his disturbances of general sensibility to a "magneto-

[1] Johannes Mueller. *Loc. cit.*

[2] Wernicke. *Grundriss der Psychiatrie*, p. 126.

electro-psychologic " current. Another received the visions from a " theologico-celestial projector."

Affectivity.—Hallucinations are sometimes agreeable, at other times painful, and occasionally, chiefly in dements, indifferent.

In the first case their outward manifestations are an appearance of satisfaction, an expression of happiness, and sometimes ecstatic attitudes.

In the second case, which is the more frequent, the patients become sad, gloomy, or, on the contrary, agitated and violent, a prey to anxiety or anger.

The two kinds of hallucinations, agreeable and painful, are occasionally encountered in the same subject. Sometimes they follow each other without any regular order and are coupled with a variable disposition and incoherent delusions, as in maniacs and in general paralytics; at other times they follow each other somewhat systematically—the painful hallucinations are combated by the agreeable ones. The patients often speak of their persecutors, who insult, threaten, and abuse them, and of their defenders who console them, reassure them, and repair the damage done by the former. A persecuted patient heard a voice call her " a slut "; immediately another voice responded, " He lies; she is a brave woman." Some patients tell of their limbs being smashed and their viscera extracted every night, but that nevertheless they are sound and safe when they arise, thanks to the good offices of their defenders, who properly replace everything. These two sets of hallucinations constitute what the patients sometimes call the *attack* and the *defense.*

The indifferent hallucinations are of but little interest. They are met with at the terminal periods of processes of deterioration, and also at the beginning of convalescence in acute psychoses. In the latter case they rapidly become conscious hallucinations and finally disappear.

Reactions.—The influence of hallucinations upon the will depends upon the state of the judgment and of the

affectivity. If the judgment is sound, if the hallucinations are looked upon as pathological phenomena, they give rise to no reaction; and the same is the case when they make no impression upon the emotions.

But when they are accepted by the patient as real perceptions and influence strongly the emotional state, hallucinations, on the contrary, govern the will to a very considerable extent and prompt the patient to defend himself against the ill-treatment of which he believes himself to be the object or to obey the commands which are given him (imperative hallucinations). Hence the frequency of violent and criminal acts committed by the insane, and the well-known axiom in psychiatry according to which all subjects of hallucinations are dangerous patients. Revington has found, from a study of forty-nine cases of homicide committed by insane patients, that in most instances the murder resulted from a hallucination.[1]

The reactions caused by hallucinations are often abrupt, unreasonable, and of an impulsive character, especially in the feeble-minded and in patients with profound clouding of consciousness (delirium tremens, epileptic delirium). But they may also show all the evidences of careful premeditation. Certain persecuted patients, exasperated by their painful hallucinations, prepare their vengeance with infinite precaution.

The influence of hallucinations upon the will is often so powerful that nothing can combat it, neither the sense of duty, nor the love of family, nor even the instinct of self-preservation. A patient passing near a river heard a voice tell him: "Throw yourself into the water." He obeyed without hesitation, and to justify himself declared simply: "They told me to do it; I was forced to obey."

Combined Hallucinations.—Sometimes hallucinations affect but one sense. Such are the hallucinations of hearing at the beginning of systematized delusional states. Gen-

[1] Revington. *Mental Conditions Resulting in Homicide.* The Journ. of Ment. Sc., April, 1902.

erally, however, the pathological disorder affects several senses, the different hallucinations either following one another, or existing together without any correlation, or combining themselves and producing complex scenes either of a fantastic aspect or analogous to real life. In the latter case they bear the name of *combined hallucinations.* The patient sees imaginary persons, hears them speak, feels the blows that they inflict upon him, makes efforts to reject the poisonous substances which they force into his mouth, etc. This state, closely related to dreams, is always accompanied by marked clouding of consciousness.

Diagnosis of Hallucinations.—Two possibilities may present themselves: (1) the patient directly informs the physician about his condition; (2) he gives no information whatever, either because of his reticence or because of his intellectual obtuseness.

In the first case the diagnosis of hallucinations is generally easy. It is necessary, however, to ascertain that the pathological phenomenon is really a hallucination, and not an illusion; in other words, that it is a perception without an object, and not an inaccurate perception. Only a detailed examination of the circumstances under which the phenomenon shows itself may prevent an error; it is very difficult indeed when a subject hears himself being called a thief in the midst of thousands of street noises, to decide whether he experiences a hallucination or an illusion. The certainty is, on the other hand, much greater when the morbid perception occurs in absolute silence, as during the night.

In the second case the diagnosis must be made without the assistance of the patient, or even in spite of his denials. It must be based only upon the patient's attitudes, movements, and at times upon the means of defense to which he resorts and which vary according to the sense affected. The ear turned for some time in a certain direction, the eyes fixed or following a definite line without there being any real object to attract them, the ears stuffed with foreign

bodies, evidences of strong emotions, an expression of fear, etc., lead to the presumption of the existence of hallucinations. I say *presumption* because the external signs do not enable us to establish with certainty the patient's state of consciousness. Over-refined psychological analyses are to be mistrusted if one is to avoid unwarranted conclusions which would render the diagnosis and prognosis faulty.

Relations between Hallucinations and other Mental Disorders.—What position do hallucinations occupy in the genesis of the psychoses? Are they primary or secondary?

It is not impossible that at times, notably in the intoxications and in cases of localized lesion, hallucinations appear first and are the cause of the other mental disturbances which follow. In practice, however, such cases occur but rarely. A careful and complete history almost always shows that the hallucinations are preceded by other symptoms: depression, intellectual obtuseness, clouding of consciousness, delusions, etc.

Indeed it is difficult to conceive of one or more hallucinations appearing in a person free from all other mental trouble, without their being at once corrected by the judgment aided by the other senses. On the other hand it is quite intelligible that imaginary perceptions may exercise an influence upon the attention, the emotions, the judgment, and the will, if they are but the reflection or the realization of the patient's preoccupations and morbid ideas, that is to say, if they are secondary. The melancholiac who believes himself guilty of a crime sees and hears the police officers who are coming to arrest him. The paranoiac who believes himself to be exposed to the malevolence of his imaginary enemies hears their voices insulting him. The general paralytic with pleasing and expansive delusions experiences pleasant sensations. Hallucinations are, then, *an expression, and not a cause,* of delusions; and that is why they harmonize so perfectly with the mental state of the subject.

Some psychiatrists[1] have described a *hallucinatory delirium* as a distinct morbid entity the essential features of which are the multiplicity and the primary character of the hallucinations. If the idea which we attempted to convey above is correct, hallucinations, never or almost never being primary, cannot form the essential and exclusive feature of an affection, and hallucinatory delirium cannot retain its autonomy. For this reason most authors classify such cases with confusional psychoses, general paralysis, dementia præcox, and toxic psychoses.

General Etiology of Hallucinations.—On this subject we possess but very incomplete information.

Hallucinations appear readily in states of impaired consciousness, as epileptic delirium and the toxic psychoses. The hallucinations which precede sleep in certain nervous subjects are most frequently of the conscious type and are to be attributed to weakening of consciousness.

Hallucinations are very apt to appear in the absence of real sensations—those of hearing during silence and those of vision in darkness. This explains why isolation in prison cells predisposes to hallucinatory psychoses (Kirn, Rüdin).[2]

In some instances hallucinations are produced in a somewhat automatic manner, at the occasion of some definite impression. One patient felt a taste of sulphur in his mouth whenever the name of one of his persecutors was uttered in his presence. Such hallucinations have been described by Kahlbaum under the name of *reflex hallucinations.*

Hallucinations may depend to a certain extent upon a peripheral excitation either of the sensory organ itself or of the conducting nerve. They are in such cases frequently *unilateral.* "Max Busch has brought about a notable improvement in the mental condition of a patient

[1] Farnarier. *La psychose hallucinatoire,* Paris, 1899.

[2] Rüdin. *Eine Form akuten hallucinatorischen Verfolgungswahns in der Haft,* etc. Allg. Zeitschr. f. Psychiat., 1903.

who had auditory hallucinations which were most marked on the left side, by treating his otitis media with perforation of the drum membrane, which he had contracted during childhood."[1] Visual hallucinations have been observed to appear as the result of ocular lesions, such as cataract, and to disappear under appropriate treatment. These peripheral lesions are, so to speak, but a pretext for the hallucinations, and are not to be considered as their true cause. The cause is to be looked for in a special state of morbid irritability of the centers of perception which causes them to react by hallucinatory phenomena to abnormal peripheral excitation.[2] Hallucinations sometimes occur in cases in which the corresponding sensory function has been lost completely. Thus auditory hallucinations may be associated with total deafness, unilateral or bilateral.

Peripheral hallucinations are very analogous to Liepmann's phenomenon: if in a convalescent alcoholic slight pressure is made upon the eyeballs, hallucinations are sometimes induced, even when the subject does not any more experience them spontaneously. The peripheral excitation transmits to the brain nothing but a nervous discharge, the clinical expression of which is the hallucination. The fact that a great many patients present very grave and old standing lesions of the sensory organs without having any hallucinations is also evidence to prove that these affections are of but secondary importance in the causation of psychosensory disorders.

Finally, hallucinations may be induced by *suggestion.* Sometimes it suffices merely to fix the attention of the patient upon a certain point for him to discover imaginary objects, persons, or forms. Such is frequently the case in toxic states, notably alcoholism and cocainism, also in

[1] Quoted by Legay. *Essai sur les rapports de l'organe auditif avec les hallucinations de l'ouïe.* Thèse de Paris, 1898, p. 25.

[2] Joffroy. *Les hallucinations unilatérales.* Arch. de neurol., 1896, No. 2.—Mariani. *Un cas d'hallucination unilatérale.* Riforma medica, 1899, Nos. 30 and 31.

certain dementias. In an observation kindly communicated by Thivet, a patient read whole words upon a blank surface that was presented to him.

B. . SPECIAL FEATURES OF EACH VARIETY OF HALLUCINATIONS

Hallucinations of Hearing.—In pathological states, as in the normal state, auditory sensations occupy a position of primary importance among the psychic functions; thus, of all hallucinations those of hearing are clinically the most frequent and the most important.

Séglas[1] classifies them in three categories: "*Elementary* auditory hallucinations, consisting of simple sounds; *common* auditory hallucinations, consisting of sounds referable to definite objects; and *verbal* auditory hallucinations, consisting of words repesenting ideas."

Wernicke[2] combines the first two categories under the name of *akoasms*, and designates the third, the only one that seems to him to merit separate consideration, by the name of *phonemes*.

Akoasms comprise imaginary noises of a variable nature, such as buzzing, whistling, screaming, groaning, ringing of bells, explosions of firearms, etc. Their clinical significance is the same as that of hallucinations in general, and their influence upon the mind depends upon their interpretation by the patient.

Phonemes (the verbal auditory hallucinations of Séglas) have on the contrary a special significance, inasmuch as they consist of "words representing ideas." Their influence is much more direct and much more powerful than that of akoasms.

[1] *Leçons cliniques sur les maladies mentales et nerveuses*, p. 5.—*Pathogénie et physiologie pathologique de l'hallucination de l'ouïe.* Congrès des médecins aliénistes et neurologistes, 1897.

[2] *Loc. cit.*, p. 189.

Their content varies from isolated words to the most complicated discourses. Sometimes the words or phrases are pronounced indistinctly, resembling a faint murmur; at other times they are perceived with remarkable clearness. "It seems to me," patients often say, "that somebody is speaking very near me. . . .I hear my enemies as well as I hear you." This distinctness largely accounts for their being accepted as real voices, and explains partly the remarkable influence of auditory hallucinations.

The "invisible ones," as the patients often call the imaginary voices, are sometimes localized with extraordinary precision. "The insane manifest a power of localization not encountered in other than pathological states."[1] The distance at which they believe they hear the voices is very variable; the voices may be very close by or, on the contrary, hundreds of miles away. Many patients hold the persons that are around them responsible for the hallucinations; thus are explained some of the sudden assaults often committed by such patients. Others ascribe their hallucinations to inanimate objects. One patient accused her needle, another her stockings. Still others lay the blame upon invisible instruments which are used by their enemies (phonographs, telephones, megaphones, etc.).

Like all other hallucinations, those of hearing vary with the nature of the mental trouble; sad in the painful states, agreeable and cheerful in the expansive states. Usually the names by which the patients designate the "invisible ones" are not very choice ones, consisting chiefly of profane or even filthy expressions. Unpleasant hallucinations may alternate with agreeable ones in the manner of *attack* and *defense*, as has already been stated. Sometimes each of the two varieties of hallucinations is perceived by only one ear.

The voices may repeat the thoughts of the patient, even before he has a chance to express them. "They know before I do what reply I wish to make," said one such patient. Another said: "When I read they read at the same

[1] Wernicke. *Loc. cit.*, p. 205.

time and repeat every word." Many complain that their thoughts are stolen from them.[1]

Quite often the voices create neologisms the meaning of which may remain absolutely enigmatical to the patient himself, or to which he may attribute a significance which harmonizes with his psychic state.

The timbre of the voices is very variable. In some cases the patient always perceives one and the same voice; but more frequently many voices are heard: voices of men, women, and children, which are sometimes unknown to the patient, at other times familiar, enabling him to establish the identity of his persecutors.

Although they are encountered in a great many mental affections, acute and chronic, hallucinations of hearing, if they constitute a prominent feature by reason of their multiplicity, distinctness, or intensity, usually point to a grave prognosis. Their occurrence in an acute psychosis often forebodes a particularly long duration of the disease.

Hallucinations of Sight.—Hallucinations of sight chiefly occur in toxic and febrile deliria.

They vary greatly in distinctness. At times they are so clear that the patient is able to make a sketch of them; often they are, on the contrary, vague and uncertain.

Like the *voices*, the *visions* are apt to be taken for reality by the subject; he seeks to remove them, to shun them, or on the contrary to seize them. They are in such cases coupled with more or less marked clouding of consciousness.

Many patients, on the contrary, consider their hallucinations as *artificial phenomena*. The more conscious and the clearer in mind the patient is, the mere apt he is to recognize the difference between the real world and his visions, because, with the exception of the cases in which consciousness is profoundly disordered, visual hallucinations "seldom bear the appearance of reality."[2] They lack the

[1] Bechterew. *Ueber das Hören der eigenen Gedanken.* Arch. f. Psychiatric, Vol. XXX.

[2] Wernicke. *Loc. cit.*, p. 194.

proper qualities of normal visual sensations: perspective, clearness of contour, variety of tints, etc. Often the morbid image appears in a single plane, hazy in outline, and grayish in color. It is therefore not surprising that, not possessing the attributes of true perceptions, visual hallucinations are often not taken for reality, and do not exercise upon the mind of the patient the same degree of influence as do phonemes.

Some patients consider their hallucinations as shadows or images *which they are made to see artificially* by means of projecting apparatus, electric currents, etc. Others attribute them to the pernicious action of poisons which their enemies make them absorb.

Visual hallucinations may take the form, though rarely, of verbal hallucinations of vision. The patients see words and phrases on tables, walls, etc. A subject of choreic insanity observed in Joffroy's clinic saw her own name written on her apron. Everybody is familiar with the famous words *Mene, mene, tekel, upharsin,* which the guests saw appear upon the wall at Belshazzar's feast.

Hallucinations of Taste and Smell.—The senses of taste and smell are as closely associated in pathological states as they are in the normal state. Therefore hallucinations of these senses are usually considered together.

Their clinical significance varies, depending upon whether they coexist with psychic and somatic disorders of an acute nature, or whether they appear in the course of a chronic psychosis.

In the first case they often result from dryness and inflammation of the nasal and buccal mucous membranes or glands. They disappear with the disturbances of these glands, and they may be modified very favorably by appropriate treatment. Their importance with regard to prognosis in such cases is very slight.

It is altogether different in the second case, when they supervene independently of the above causes in the course of chronic psychoses. They almost always indicate a

profound alteration of personality and progress toward dementia.

Hallucinations of taste and smell are mostly unpleasant. The patients complain of nauseating odors; putrid emanations are *blown* toward them; they are made to eat fecal matter; poisons are poured into their mouth, etc. They make use of certain means of defense, such as spitting, stuffing the nostrils with cotton or paper, and, what constitutes a very grave symptom, *refusal of food.*

Hallucinations of Touch, Thermal Sense, and Sense of Pain.—These are often placed in a single group under the name of *hallucinations of general sensibility.*

Hallucinations of *touch* are frequent in certain toxic psychoses (delirium tremens, cocaine delirium), and in chronic delusional states. The patients feel the breath of somebody or the contact of something; they feel as though spiders are crawling upon their bodies, or they may have a sensation of being bound in an entangled mass of cords.

Closely related to the above are hallucinations of the *genital sense,* which are encountered in mania, and in many other acute and chronic psychoses. They consist of either painful or voluptuous imaginary sensations. When they coexist with perfect lucidity they generally indicate a very grave prognosis.

Hallucinations of the *thermal sense* and of the *sense of pain* are a feature of chronic delusional states. The patients complain of being burned alive, that their body is being pierced with a red-hot iron, that they are being thrown off from their chair, that they are made to experience shocks like those of electric discharges, etc.

Motor Hallucinations.—A motor hallucination may be defined as an imaginary perception of a movement. It constitutes a disorder of that kind of sensibility which has been designated by the term muscular sense.

Analogous phenomena are encountered in normal persons, the sensation of heaviness or of lightness of the limbs, which we experience during sleep, are justly attributed by

Beaunis[1] to disturbances of the muscular sense; the *illusions referred to an amputated limb* are often accompanied by motor hallucinations.

Motor hallucinations are frequent in psychotics. Some feel themselves being raised from their bed, shaken continually against their will, etc. Others, like mediæval sorcerers, imagine themselves flying through the air.

By a well-known psychological process the sensation tends to transform itself into an act, the motor image into a movement. *The motor hallucination becomes an impulse.* The patient feels with astonishment that his limbs, his tongue, or his mouth become the seat of movement in which his will takes no part. A patient of Krishaber's, for instance, felt his legs "move as though endowed with a power other than that of his own will." Many persecuted or mystic patients affirm that they have been transformed into automatons, and that God or their enemies, as the case may be, make them go and act as they wish.

There is a certain form of motor hallucinations which deserves particular attention by reason of its frequency, its clinical importance, and its high psychological interest; these are the *verbal* motor hallucinations which have been admirably described by Séglas.[2] As their name indicates, they affect the function of speech. The patient is conscious of involuntary movements of his tongue and lips, identical with those which produce articulation of words. The sensation may exist alone or it may acquire such intensity that it is transformed into actual motion, and the patient begins to speak in spite of himself. Often the pathological movements are scarcely apparent, being limited to an inaudible whisper. Sometimes the impulse is so strong that it results in loud talking or screaming. The remarks made by the patient in such a case may be entirely discordant with his true sentiments. In this way such patients may uninten-

[1] *Les sensations internes*, 1889, Paris, F. Alcan.

[2] *Leçons cliniques.* Also *Les troubles du langage chez les aliénés.* (Bibliothèque Charcot-Debove.)

tionally insult their relatives, making use of obscene language, blasphemies, etc. At other times the thoughts of the patient are spoken out in spite of himself. Pierracini has termed this phenomenon "the escape of thought." (Quoted by Séglas.)

Verbal motor hallucinations exercise upon the function of speech, even in those cases in which they do not reach the stage of actual articulatory movements, so powerful an inhibitory influence that the subject becomes totally unable to speak. This is in perfect accord with the observation of Stricker, who found that two verbal motor images cannot exist at the same time. Already occupied by the hallucinatory motor image, consciousness remains closed to normal motor images. Verbal motor hallucinations are thus a *cause of mutism.*

Graphic motor hallucinations affect written speech. "The graphic image then comes into play, and in consequence of the morbid irritability of the special cortical center for written speech the patient has the exact perception of a word with the aid of the representations of the coördinate movements which would accompany it if he were really writing the word." [1]

When this morbid irritation attains a certain degree of intensity the hallucination becomes a *graphic impulse* and gives rise to *automatic writing,* which is often met with in "writing mediums."

The interpretation of motor hallucinations varies in different patients. Some complain that their enemies govern their tongues by means of invisible wires. Others, feeling themselves no longer masters of their own organs, are naturally led to think that a strange personality has become established beside them. Some of the "possessed" of mediæval times undoubtedly had motor hallucinations.

Motor hallucinations generally imply a grave prognosis. They indicate an already advanced disaggregation of the personality. Accordingly they are chiefly encountered

[1] Séglas. *Les troubles du langage,* p. 246.

in the chronic psychoses; they may appear, however, in certain acute psychoses, such as melancholia (Séglas) and alcoholic delusional states (Vallon, Cololian).[1]

Theories of Hallucinations.—Johannes Mueller was of the opinion that hallucinations are the consequence of abnormal irritation of peripheral sensory organs.

According to Meynert they result from automatic activity of subcortical cerebral centers, which are no longer inhibited by the cerebral cortex as they are in the normal state.

The primary cause of hallucinations would thus be a suppression of the inhibitory power of the cortex, which is one of the manifestations of cortical paralysis. The hallucination is then the consequence of a supremacy of lower cerebral functions over higher ones.

Finally, according to Tambourini, hallucinations are produced by the *automatic activity of a psychosensory projection-center.*

Under what conditions does the automatism of the projection-center come into play? Is it under the influence of direct irritation resulting, for instance, from a tumor or from a circumscribed patch of meningitis localized exactly at this center? Such cases have occurred. Sérieux[2] has observed verbal motor hallucinations in a general paralytic in whose case the autopsy showed a predominance of the lesions of meningo-encephalitis at the level of the lower portion of the left third frontal convolution. The lesion must not, however, be a too destructive one. "Indeed, for a center to be able to produce hallucinations, it is necessary that conditions of integrity be preserved sufficient to permit its activity" (Joffroy).[3]

[1] Cololian. *Les hallucinations psycho-motrices verbales dans l'alcoolisme.* Arch. de Neurol., Nov., 1899.

[2] *Sur un cas d'hallucination motrice verbale chez une paralytique générale.* Bull. de la soc. de méd. ment. de Belgique, 1894.

[3] *Les hallucinations unilatérales.*—Siebert has also reported a case in which very pronounced hallucinations of the sense of smell persisted for a long time and subsequently disappeared by degrees. At

Most frequently, however, the center of projection is not the seat of any demonstrable lesion. It seems, then, that in most cases the hallucinations are the consequence, not of a direct irritation of the psychosensory center itself, but rather of an indirect irritation coming from another portion of the cortex. This explains why hallucinations are always a secondary phenomenon, and why they are but an expression, a reflection of the pathological preoccupations of the patient.

Wernicke has conceived a very ingenious theory of hallucinations, founded upon his general hypothesis of *sejunction.* By this term he designates a temporary or permanent interruption of the paths followed normally by a nervous impulse. This impulse cannot pass on freely, and accumulates above the point of the lesion like the water in a river above a dam. When this accumulation occurs in a psychosensory projection-center it sets up there a state of abnormal irritation of which the clinical expression is a hallucination.

the autopsy the hippocampus was found to be destroyed by a tumor. The author supposes that the hallucinations were caused by irritation of the center in question by the growth, and that they did not cease until this center was destroyed. (Monatschr. für Psych. u. Neurol., Vol. VI.)

CHAPTER III

SYMPTOMATOLOGY (*Continued*)

CONSCIOUSNESS—MEMORY—VOLUNTARY ASSOCIATION OF IDEAS—ATTENTION—AUTOMATIC ASSOCIATION OF IDEAS—JUDGMENT

§ 1. Disorders of Consciousness

Consciousness may be lost: *unconsciousness;* or weakened: *clouding of consciousness.*

Unconsciousness and Clouding of Consciousness.—*Unconsciousness* exists physiologically in dreamless sleep, and pathologically in coma and in complete stupor.

Clouding of consciousness represents the fundamental element of many psychoses. It is always coupled with more or less complete *disorientation.*

A complete orientation implies the integrity of the following three notions:

1. The notion of our own personality (autopsychic orientation of Wernicke);

2. The notion of the external world (allopsychic orientation of the same author);

3. The notion of time.

These three notions may disappear together or singly. We shall see later that in certain affections, notably in delirium tremens, the orientation of time and place is lost, while that of personality remains intact. The patient is ignorant of the fact that he is in a hospital ward, does not appreciate his surroundings, and cannot give even approximately the real date. But he knows that he is Mr. X.,

following such and such an occupation, so and so many years old, born on such and such a day, etc.

Allopsychic disorientation, or loss of the notion of the external world, is often coupled with many hallucinations. Some authors see in the two symptoms a causative relation; the hallucinations transport the patient to an imaginary world, thus making him lose the notion of the real world. Experience does not bear out this hypothesis: (1) because the orientation may be perfectly preserved in spite of intense and unceasing hallucinations; (2) because, inversely, it may be profoundly disordered without there being hallucinations of any kind; (3) because in most of the cases in which these two symptoms are associated the disorientation precedes the psychosensory disturbances.

Influence of Clouding of Consciousness upon the Emotions and upon the Reactions.—Unconsciousness and clouding of consciousness find expression, in the emotional sphere, in indifference and dullness; and, in the psychomotor sphere, in aboulia which in extreme cases may amount to complete inaction.

If complicated by symptoms of excitement, hallucinations and illusions, delusions, or anxiety, clouding of consciousness is accompanied by emotional phenomena and reactions characteristic of these symptoms. It is important to remember above all that the disorder of consciousness may impart to the reactions of the patient a more or less impulsive character; hence their brutal and sometimes ferocious nature.

Diagnosis of Clouding of Consciousness.—Unconsciousness is generally apparent from the absolute indifference of the subject who fails to react even to the strongest stimulation. However, it is necessary to exercise great caution in many cases. We shall see later on that certain patients, the *catatonics*, present every appearance of unconsciousness and may nevertheless preserve perfect lucidity; the disorder of consciousness is here only a seeming one. Often one is obliged to wait before coming to a decision; when the

attack passes off, the patient himself may tell of his former condition, either declaring that he has no recollection of what passed during the attack—in which case the unconsciousness was real—or explaining that, though perceiving external impressions, he was unable to react—in which case the unconsciousness was but a seeming one.

Clouding of consciousness is determined by putting to the subject a series of questions concerning his age, occupation, the date, the surroundings, and the persons about him.

States of Obscuration.—By this term are designated those pathological states in which lowered consciousness is the dominant feature. States of obscuration vary greatly in their aspect, and probably also in their nature. All, however, possess one feature in common: they leave behind almost complete amnesia for the occurrences that have taken place during their entire duration. But the degree of consciousness at the time of the attack itself is very difficult to determine, and probably varies greatly.

Often patients afflicted with violent delirium have but an extremely confused notion of their surroundings, and their acts bear the character of complete automatism. Such are cases of epileptic delirium.

Others, on the contrary, perform complicated acts, such, for instance, as are involved in a long voyage, in a sober and reasonable manner and without attracting anybody's attention; and still they may have no subsequent recollection of these acts. This occurs in certain *pathological absences* which are most commonly observed in epilepsy but which may also be encountered in various psychoses.

It can scarcely be assumed that in these two cases the disorders of consciousness are identical.

§ 2. Disorders of Memory

An act of memory comprises three distinct operations:

1. The fixation of a representation;
2. Its conservation;

3. Its revival, that is to say, its reappearance in the field of consciousness.

These may be disordered together or singly; hence the three forms of amnesia:

A. Amnesia by default of fixation (or simply amnesia of fixation), also known as *anterograde amnesia;*

B. Amnesia of conservation;

C. Amnesia of reproduction.

The latter two affect impressions previously acquired and constitute *retrograde amnesia;* there are therefore two varieties of retrograde amnesia: (1) by default of conservation, and (2) by default of reproduction.

A. Amnesia of Fixation: Anterograde Amnesia.—The power of fixation (*Merkfähigkeit* of German authors) is dependent upon the distinctness of the perceptions. Therefore all conditions in which perceptions are vague and uncertain are accompanied by a more or less marked amnesia of fixation; such is the case in epileptic deliria and in acute confusional psychoses.

Distinctness of perception is therefore a condition neccssary for the normal working of memory; it is, however, not in itself a sufficient condition. An impression, though very clear and very precise at the moment, may not become fixed in the mind. Thus a patient with polyneuritic psychosis may understand perfectly the questions put to him, execute properly the orders that are given him, so that on a superficial examination he may convey the impression of a normal person; but he preserves an incomplete recollection, or none at all, of the occurrences of the whole period of his illness. It seems, then, that for proper fixation is required, besides sufficient distinctness of perception, some other condition the nature of which is as yet undetermined.

B. Retrograde Amnesia by Default of Conservation.—An impression fixed in memory is preserved for a greater or lesser length of time, depending upon its nature and upon the individual capabilities of the subject. The memory of an

important event persists longer than that of an insignificant one. Certain individuals possess a prodigious memory, others a very poor one or almost none at all; between these two extremes there are infinite gradations.

The disappearance, under the influence of some pathological cause, of impressions previously acquired, constitutes what we have termed *amnesia of conservation.* This *destructive,* and consequently *incurable,* form of amnesia is the principal factor of certain types of dementia, and is often the first sign that warns the patient's relatives of the beginning condition.

The disappearance of impressions may be more or less complete, depending upon the nature of the dementing process. While many precocious dements for a long time preserve a relatively good memory, general paralytics and senile dements present from the beginning of their illness marked amnesia.

Amnesia of conservation is generally associated with the other two forms of amnesia: amnesia of fixation and amnesia of reproduction.

C. Retrograde Amnesia by Default of Reproduction.—In the normal state an impression fixed and preserved in memory possesses the property of being revived under certain conditions. In pathological conditions this power of reproduction may be suspended: the impressions exist, but they are dormant and cannot be revived. This form of amnesia is encountered in many acute psychoses, notably in manic depressive, acute confusional, and toxic psychoses. Its prognosis is of course much more favorable than is that of the preceding form.

The Course of Amnesia.—The *onset* may be sudden or insidious; it is often sudden in amnesia of reproduction—pure or associated with amnesia of fixation—and almost always insidious in amnesia of conservation.

Amnesia may be *stationary, retrogressive,* or *progressive;* it is stationary when, certain impressions having become destroyed, the defect persists without increasing; retrogressive

when the impressions, simply dormant, reappear little by little; and progressive when, as the pathological process advances, the number of destroyed impressions becomes greater from day to day.

In progressive amnesia the disappearance of impressions occurs not at random, but in a definite order. "The progressive destruction of memory follows a logical course, a law. *It descends progressively from the unstable to the stable:* it begins with recent impressions which, fixed imperfectly upon the nervous elements, seldom repeated and therefore but feebly associated with others, represent the organization in its weakest degree; it ends with that instinctive, sensory memory which, stably fixed in the organism and having become almost an integral part of it, represents the organization in its strongest degree. From the beginning to the end the course of amnesia, governed by the nature of things, follows the line of least resistance, that is to say, the line of least organization."[1] In senile dementia, in which the law of amnesia is most perfectly demonstrated, the impressions of old age are the first to become effaced, later those of adult life, and finally those of youth and childhood. Some of the latter may remain intact long after the general ruin of memory and other faculties. It is not uncommon to meet with advanced senile dements who, though incapable of recollecting the existence of their wife and children, are still able to relate with minute details the occurrences of their childhood or to recite correctly fragments from the works of classic authors.

The law of amnesia, though always the same, is difficult to demonstrate in those affections in which the destruction of memory progresses very rapidly, where many impressions, like other manifestations of intellectual life, disappear *en masse.* In general paralysis the course of amnesia is much more rapid and much less regular than in senile dementia. This fact, as we shall see, is an important element in diagnosis.

[1] Ribot. *The Diseases of Memory.*

Varieties of Amnesia.—Amnesia is said to be *partial* when it involves only one class of impressions, for instance proper names, numbers, certain special branches of knowledge (music, mathematics), or a foreign language. A young man coming out of a severe attack of typhoid fever forgot completely the English language, which he had spoken fluently before the onset of his illness; other impressions were quite well preserved. When it involves verbal images the amnesia determines a particular form of aphasia, *amnesic aphasia*.

Amnesia is *general* when it affects equally all classes of impressions. Most of the progressive amnesias are general.

Amnesia may be *limited to a certain period of existence*. In such cases its onset is almost always sudden, and it is either anterograde, or retrograde by default of reproduction.

Localization of Recollections.—A recollection of an occurrence, once evoked, is usually easily localized by us as to its position in the past. This power of *localization* disappears in certain psychoses. The patients cannot tell on what date or even in what year some event occurred, an impression of which they have, however, preserved. The default of localization in the past combined with a certain degree of anterograde and retrograde amnesia produces *disorientation of time*.

Illusions and Hallucinations of Memory.—In an illusion of memory a past event presents itself to consciousness altered in its details and in its relation to the patient, and exaggerated or diminished in importance. Thus one senile dement claimed to have superintended the construction of a Gothic cathedral several centuries old, holding, as he said, "the calipers in one hand and the musket in the other to defend myself against the Saracens." Upon inquiry it was found that the patient had really worked about thirty years previously on the restoration of an old cathedral.

An illusion of memory becomes a true hallucination when the representation perceived as a recollection does not correspond to any actual past occurrence. A patient who

had been in bed during several weeks related once that on the previous day he assisted at the coronation of the Russian emperor: this is a representation without an object, a hallucination of memory.

Illusions and hallucinations of memory form the basis of *pseudo-reminiscences* which are met with in many psychoses, especially in the polyneuritic psychosis.

Pseudo-reminiscences are not infrequent in certain persons who are usually not classed with psychotics. In such cases the hallucinations and illusions of memory occur on a basis of abnormally vivid mental images which an inadequate auto-critique fails to correct.[1]

In some cases pseudo-reminiscences occur in such abundance as to constitute the principal symptom of the disease. Thus one patient imagined himself to have participated in all the important historical events of his epoch, particularly in the great military actions. He had taken part successively in the campaigns of Tonquin, Madagascar, and Dahomey, also in the Spanish-American war and in the Boer war, serving in different grades—now as corporal, now as sergeant-major, now as colonel. During all that time he had had several conferences with the German emperor, also with the empress, his cousin. When his reminiscence had bearing upon some historical event the patient would give details culled from magazines or from popular books, and related them with a degree of accuracy which indicated a good memory.

We would mention lastly a curious form of illusion of memory, which has been designated by the expression *illusion of having already seen*. "It consists in a belief that a state of consciousness that in reality is new was experienced before, so that when it first occurs it is thought to be a repetition."[2] One patient claimed that all the occurrences

[1] Delbrück. *Die pathologische Lüge und die psychisch abnormen Schwindler.*—Koeppen. *Ueber die pathologische Lüge* (Pseudologia phantastica). Charité Annal., Jan., 1898.

[2] Ribot. *Loc. cit.*

which he was witnessing had taken place a year previously, day by day. He made a great deal of noise at the marriage of one of his sisters, demanding to know why a ceremony which had already been performed a year ago was begun over again, and protesting that it was all a farce.[1]

§ 3. Attention and Association of Ideas

Disorders of Attention.—Attention manifests itself in two forms: *spontaneous* and *deliberate* or *voluntary*. Spontaneous attention, the inferior and less complex of the two forms, consists " in a direction of the being toward the stimulus " or " in a simple and spontaneous fixation of phenomena." Deliberate attention directs the association of ideas and governs the course of representations, allowing each to remain for a greater or lesser length of time in the field of consciousness; in other words, it brings about voluntary and conscious psychic activity.

Complete paralysis of attention involves loss of spontaneous attention as well as of voluntary attention. It coexists always with considerable clouding of consciousness, there being no possibility of the production of any state of consciousness without a certain degree of at least spontaneous attention.

Abnormal mobility of attention consists in paralysis of deliberate attention, spontaneous attention being intact and in most cases even exaggerated. An impression of any kind suffices to distract the mind of the subject, but no impression can fix it. This phenomenon is well illustrated by the following experiment. A manic patient was asked to tell about the death of his mother, which, incidentally, was the cause of his illness. He began: " The poor woman came home from her work in the evening. She was taken with a chill. . . " One of the assistants picks up a pencil from the table in front of the patient. " Hold on! there is a pencil,

[1] Arnaud. *Un cas d'illusion du déjà vu ou de fausse mémoire.* Ann. méd. psych., May–June, 1896.

a blue pencil. . . . Can you draw?" Another assistant begins to cough. "If you have a cough you should take Geraudel's tablets. . . . You know, spitting on the floor is prohibited. . . . That's a fact. . . ." The first assistant unbuttons his coat. "I hope you are not going to undress here, that would be improper! . . ." Noticing a small rent in the vest of the same assistant: "I guess you have no wife to do your mending! . . ." This example shows how the mind, deprived of the guidance of voluntary attention, drifts at the occasion of various external impressions without ever becoming fixed.

Disorders of Association of Ideas.—Associations are of two kinds: *voluntary* and *automatic.* Voluntary associations are under the control of attention and are effected in a special order which is determined by a principal idea termed the *guiding idea.* Automatic associations are, on the contrary, produced spontaneously and without any guiding idea. They constantly threaten to deviate the course of voluntary associations; one of the principal functions of deliberate attention consists in inhibiting automatic associations.

Weakening of attention is closely connected with *sluggish formation of voluntary associations.* This latter symptom is manifested clinically by slowness of apprehension, and experimentally by lengthening of reaction-time, that is, the time required for a sensation to be transformed into a voluntary and conscious movement.[1]

Weakening of attention and sluggishness of voluntary associations constitute the earliest and most constant manifestations of psychic paralysis. Combined with insufficiency of perception and with more or less pronounced disorder of consciousness, they bring about *mental confusion,* a syndrome which may occur as an episode in the course of a great many mental diseases and as a permanent manifestation of an affection known as primary mental confusion.

[1] Pierre Janet. *Névroses et idées fixes,* Paris, F. Alcan.—Sommer. *Lehrbuch der psychopathologischen Untersuchungsmethoden,* 1899.

The intensity of this state may be of three degrees:

1st degree: diminished capacity for intellectual exertion, rapid fatigue;

2d degree: intellectual dullness;

3d degree: complete suspension of all voluntary intellectual activity.

Weakening of attention and sluggishness of association may exist alone, as in certain forms of melancholia, and especially in stupor, in which they attain their highest degree. They may also be associated with exaggerated activity of the mental automatism, which manifests itself by an abnormal mobility of attention and by a flow of incongruous ideas (flight of ideas, incoherence), or, on the contrary, by the appearance in the field of consciousness of some particularly tenacious and exclusive representation (imperative idea, fixed idea, autochthonous idea).

Flight of Ideas.—Incoherence.—These two symptoms constitute two different degrees of the same morbid process.

Flight of ideas, almost always dependent upon an abnormal mobility of attention, consists of a rapid succession of representations which appear in the field of consciousness without any order, at the occasion of external impressions, superficial resemblances, coexistences in time or space, similarities of sound, etc. One word arouses the idea of another of a similar sound or having the same termination (association by assonance). The following example from a manic case in which the discourse during several minutes was copied verbatim, will show, better than a description could, the character of this pathological phenomenon:

"Now I want to be a nice, accommodating patient; anything from sewing on a button, mending a net, or scrubbing the floor, or making a bed. I am a jack-of-all-trades and master of none! (Laughs; notices nurse.) But I don't like women to wait on me when I am in bed; I am modest; this all goes because I want to get married again. Oh, I am quite a talker; I work for a New York talking-

machine company. You are a physician, but I don't think you are much of a lawyer, are you? I demand that you send for a lawyer! I want him to take evidence. By God in Heaven, my Saviour, I will make somebody sweat! I worked by the sweat of my brow! (Notices money on the table.) A quarter; twenty-five cents. In God we trust; United States of America; Army and Navy forever!"

Flight of ideas was formerly considered, especially in mania, the result of excessive activity of normal intellectual function; it was believed that the patient, unable to express in words the ideas which crowd into his consciousness, is compelled to leave out a large number of them, and that these omissions cause the disconnectedness of his discourse.

In reality this exaggerated activity affects only the automatic intellectual functions and is always associated with a weakening of the higher psychic functions. The essential cause of the phenomenon is to be looked for in a weakness of attention: representation A cannot fix itself in consciousness and is immediately replaced by representation B, and so on.

While in flight of ideas the representations are still associated by their relations, which though superficial are yet real, in *incoherence* they follow each other without any apparent connection. The following is a specimen of incoherent speech obtained from a case of dementia præcox: "What liver and bacon is I don't know. You are a spare; the spare; that's all. It is Aunt Mary. Is it Aunt Mary? Would you look at the thing? What would you think? Cold cream. That's all. Well, I thought a comediata. Don't worry about a comediata. You write. He is writing. Shouldn't write. That's all. I'll bet you have a lump on your back. That's all. I looked out the window and I didn't know what underground announcements are. My husband had to take dogs for a fit of sickness."

These few lines suffice to show the profound degree of psychic disaggregation which is manifested by this phenomenon.

It is not uncommon for the two symptoms, flight of ideas and incoherence, to appear in succession, or even together, in the same subject, notably in cases of mania, in acute mental confusion, also, though less often, in dementia præcox.

Imperative Idea—Fixed Idea—Autochthonous Idea.[1]— We have stated above that mental automatism may manifest itself by the appearance of an idea that is particularly tenacious and exclusive, occupying by itself the field of consciousness, from which nothing can dislodge it.[2]

The three forms in which this phenomenon may appear have been well defined by Wernicke.[3]

An *imperative idea* imposes itself upon the patient's consciousness against his will; he recognizes its pathological character and seeks to rid himself of it. It is a parasitic idea, recognized as such by the patient.

A mother is haunted by the idea of killing her child whom she loves dearly. As she herself states, she can no longer think of anything else; but she recognizes it as a morbid phenomenon and begs to be relieved of it: this is an imperative idea.

A fixed idea, on the contrary, harmonizes with the other representations. Therefore it is never considered by the subject as foreign to the mind or as a pathological phenomenon.

A mother who has lost her child is convinced that if she had given it a certain kind of medicine the child would not have died. This idea does not leave her, appears to her perfectly legitimate and natural: this is a fixed idea.

Fixed ideas form the basis of certain delusional states, notably paranoia.

Fixed ideas are not found exclusively in cases of mental

[1] Milne Bramwell. *On Imperative Ideas.* Brain, 1895.—Kéraval. *L'idée fixe.* Arch. de Neurol., 1899, Nos. 43 and 44.

[2] This form of mental automatism may be termed *monoideal automatism.*

[3] *Loc. cit.*, p. 108.

alienation; they are encountered in the normal state as certain tendencies that may be in themselves perfectly legitimate. Such are desire for vengeance, ambition, etc.

Autochthonous ideas, like imperative ideas, develop alongside of normal associations. The only difference is in the patient's interpretation of them; while an imperative idea is recognized by him as pathological, an autochthonous idea is attributed to some malevolent influence, most frequently to some strange personality. If he complains, it is to the police officer and not to the physician. A mother believes that her neighbor forces upon her the idea of killing her child: this is an autochthonous idea.

Closely related to imperative ideas, autochthonous ideas present a similar analogy to hallucinations; like hallucinations, they are thought to be caused by automatic activity of a cortical center. But, instead of playing upon a psychosensory center, the morbid irritation occurs in a psychic center. Baillarger designated autochthonous ideas by the term *psychic hallucinations.*[1] This term has lately fallen into disuse, perhaps undeservedly.

Nothing proves more conclusively the kinship of the two classes of symptoms than the frequent transformation of autochthonous ideas into auditory, motor, and occasionally even visual, verbal hallucinations. The analogy between autochthonous ideas and verbal motor hallucinations led Séglas[2] to consider the two phenomena as identical in their nature, the first being but a rudimentary form of the second. This opinion will appear somewhat exclusive if we take into consideration the fact that autochthonous ideas may engender auditory hallucinations[3] just as readily as motor hallucinations, and that in many cases they are not accompanied by even the slightest sensation of movement.

[1] Marandon de Montyel. *Des hallucinations psychiques.* Gaz. hebd. de Méd. et de Chirurgie, March, 1900.

[2] *Leçons cliniques sur les maladies mentales et nerveuses.*

[3] Wernicke. *Loc. cit.*

Psychic hallucinations generally indicate advanced disaggregation of the personality and therefore point to a grave prognosis.

§ 4. Disorders of Judgment

Judgment is the act by which the mind determines the relationship between two or more representations.

When the relationship is imaginary the judgment arrives at a false conclusion. This becomes a *delusion* when it is in obvious conflict with evidence.

False ideas which patients often entertain concerning their own condition, believing their health to be perfect when in reality it is seriously affected, are to be attributed to impaired judgment [lack of insight]. This lack of appreciation of their own condition is not always absolute, and though in general it may be truly said that mental disease often does not recognize itself, it must, however, be acknowledged that sometimes, chiefly at the onset of the psychoses, the patients are conscious of pathological changes taking place in them.[1]

Some apply to the physician of their own accord, or even request to be committed. A sufferer from a recurrent psychosis, treated several times at the Clermont Hospital, had at the beginning of his attacks such perfect realization of his state that he would request by telegram to have attendants sent after him.

General Properties of Delusions.—The sum of a patient's delusions constitutes a *delusional system.*

Such a system may consist of purely imaginary ideas, or of ideas based upon facts improperly interpreted.

In the latter case we have *false interpretations.* When false interpretations involve occurrences of the past they are termed *retrospective falsifications.*

[1] Pick. *Ueber Krankheitsbewusstsein in psychischen Krankheiten.* Arch. f. Psychiat., Vol. XIII.—Heilbronner. *Ueber Krankheitseinsicht.* Allg. Zeitsch. f. Psychiat., Vol. LIV., No. 4.

Sometimes a delusional state follows a dream, is confounded with it, and presents all the characteristics of it (*dream delirium*); this occurs in many infectious and toxic psychoses.

Almost always delusions are multiple. Even in those cases which are sometimes designated by the term monomania, the primary morbid idea entails a certain number of secondary morbid ideas which result from it. In some cases different delusional conceptions coexist without there being any connection between them, in others they are grouped so as to form a more or less logical whole possessing greater or less plausibility. In the first instance the delusions are said to be *incoherent*, in the second *systematized*.

Whether systematized or not, delusions, like hallucinations, generally harmonize with the emotional tone. This harmony disappears when the pathological process becomes abated in intensity, as the patient either enters upon his convalescence or lapses into mental deterioration. In dements the delusions often affect neither the emotions nor the reactions. A patient may claim that he is an emperor and yet consent to sweep the hall; or one may believe himself to have lost his stomach and still eat with a hearty appetite.

Three great categories of delusions are usually distinguished:

Melancholy ideas;

Ideas of persecution;

Ideas of grandeur.

We shall limit ourselves here to a brief sketch of these, reserving the details for consideration in connection with the affections in which the delusions occur.

Melancholy Ideas.—Very common at the beginning of psychoses, melancholy ideas may persist through the entire duration of the disease, as in involutional melancholia.

The principal varieties are:

(A) Ideas of humility and of culpability. The latter are also called ideas of self-accusation;

(B) Ideas of ruin;
(C) Hypochondriacal ideas;
(D) Ideas of negation.

(*A*) *Ideas of Humility and of Culpability.*—The patient considers himself a being good for nothing, wretched, undeserving of the attention bestowed upon him, and accuses himself of imaginary faults or crimes. Often he will seek out from his past life some insignificant act to which he will attribute extreme gravity: he stole some apples when he was a boy, or he forgot to make the sign of the cross once upon entering a church. The idea of the crime committed entails also ideas of merited punishment: he expects every instant to be arrested, put to death, cut to pieces, thrown into hell, etc.

(*B*) *Ideas of Ruin.*—These are frequent in senile dements; the patient believes himself to be without any means, bereft of everything; his clothes will be sold; some day he will be found dead of starvation on a public road.

(*C*) *Hypochondriacal Ideas.*—These concern the subject himself, involving either the physical sphere—the stomach is obstructed, the spinal marrow is softened, the entire organism is affected by an incurable disease—or the psychic sphere, constituting psychic hypochondriasis: the mind is paralyzed, the intelligence is destroyed, the will power is annihilated.

Hypochondriacal ideas are sometimes dependent upon an actual diseased condition which, however, is falsely interpreted by the patient (*Hypochondria cum materia*).[1]

(*D*) *Ideas of Negation.*[2]—In some cases these concern the subject himself, and are then nothing but hypochon-

[1] Pick. *Zur Lehre von der Hypochondrie.* Allg. Zeitscher. f. Psychiat, 1903, Nos. 1–2.

[2] Séglas. *Leçons cliniques,* p. 276.—Cotard. *Du délire des négations.* Arch. de neurol., 1882.—Arnaud. *Sur le délire des négations.* Ann. méd. psychol., Nov.–Dec. 1892.—Séglas. *Le délire des négations.* Encycl. des Aide-mém.—Trénel. *Notes sur les idées de négation.* Arch. de neurol., March, 1899.—Castin. *Un cas de délire hypochondriaque à forme évolutive.* Ann. méd. psych., June, 1900.

driacal ideas pushed to an extreme: the brain, the heart, etc., are destroyed, the bones are replaced by air, the body is nothing but a shadow without a real existence. In other cases they are referred to the external world: the sun is dead, the earth is nothing but a shadow, the universe itself exists no more (metaphysical ideas of negation).

By a singular process, apparently paradoxical, hypo-ehondriacal ideas and those of negation give rise to ideas of immortality and of immensity. The patient, feeling himself, on account of the destruction of his organs, placed beyond the laws of nature, concludes that he cannot die and that he is condemned to suffer eternally; or, dismayed by the form and monstrous dimensions of his body, he imagines himself obscuring the atmosphere, filling the world, etc.

The general features of melancholy delusional states are the expression of psychic inhibition and of the painful emotional tone which constitute the basis of the melancholy state.

The following is a summary of the chief characteristics of these states, according to the admirable study of Séglas:

(*a*) Melancholy delusions are *monotonous;* the same delusions are constantly repeated, the inhibition allowing but little formation and appearance of new ideas.

(*b*) These states are *humble and passive.* The patient accuses no one but himself, and submits without resistance to the ill-treatment which he believes himself to have deserved.

(*c*) As to localization in time, the delusions are referred to the *past* and to the *future:* the patient finds in the past the imaginary sins which he has committed, and foresees in the future the chastisements which arc to be inflicted upon him. In this respect melancholy delusional states are in eontrast with persecutory dclusional states. The persecuted patient localizes his delusions chiefly in the *present.* The persecutions of which he complains are actual.

(*d*) From the standpoint of its development the melan-

choly delusional state is *centrifugal.* The trouble begins with the patient and extends gradually to his friends, his country, and the entire universe, who suffer through his faults.

(*e*) The melancholy delusional state is *secondary,* that is to say, it is the consequence of sadness and of psychic pain. It shares this characteristic with most of the other delusional states which are generally but the expression of the emotional tone of the subject.[1]

Melancholy delusions may have two grave consequences which we shall many times have occasion to emphasize: suicidal tendency and refusal of food.

Ideas of Persecution.—Like melancholy ideas, ideas of persecution are of a painful character. But while the melancholiac considers himself a culpable victim and submits beforehand to the chastisements which he believes he has merited, the subject of persecution is convinced of his innocence and protests and defends himself.

Ideas of persecution may be divided into two groups, according to whether or not they are accompanied by hallucinations.

Those of the first group are associated with hallucinations generally of an unpleasant character, among which auditory verbal hallucinations and hallucinations of general sensibility are most prominent. After a certain time the phenomena of physic disaggregation supervene: motor hallucinations, autochthonous ideas, reduplication of the personality, etc.

In the second group are ideas of persecution peculiarly associated with false interpretations; any chance occurrence is ascribed by the patient to malevolence; he sees in everything evidences of hostility against him, and attributes to the most ordinary and unimportant facts and actions a significance which is as grave as it is fanciful. This form of ideas of persecution is frequent at the onset of certain psychoses; it also constitutes the basis of an affection known as paranoia or reasoning insanity.

[1] Séglas. *Leçons cliniques.*

Some patients do not know their persecutors. Others accuse particular persons or societies (Jesuits, Freemasons). Still others bear their hatred towards some certain individual who is, in their eyes, the instigator of all the injurious procedures of which they are the victims, "the great master of the persecutions," as one such patient once said.

Of all delusions those of persecution are the most irreducible and are held by the patients with the firmest conviction. Almost always the patients resent to have them disputed. In themselves these delusions do not have an invariable influence upon the prognosis, excepting that, in a very general way, they are of more serious import than melancholy ideas.

Of all delusions these also present the greatest tendency to systematization and to progressive evolution. A perfect persecutory delusional system should comprise:

(*a*) A precise idea of the nature of the persecutions;

(*b*) An exact knowledge of the persecutors, of their aim, and of the means employed by them;

(*c*) A plan of defense in harmony with the nature of the delusions.

In the examination of cases with persecutory ideas one should always attempt to determine these points, on account of their great practical importance.

Ideas of Grandeur.—Ideas of grandeur appear chiefly in demented states and are often of a particularly absurd nature, bearing the stamp of mental deterioration. The patients are immensely rich, all-powerful; they are popes, emperors, creators of the universe. Generally they naïvely claim these pompous titles without being at all concerned by the flagrant contradiction existing between their actual state and their ostensible almightiness. A general paralytic was once asked: "If you are God, how, then, does it happen that you are locked up?" "Because the doctor refuses to let me go," he replied simply. It is not rare to see a pseudo-pope obey without a murmur the orders of hospital attend-

ants and assist with the best possible grace in the most menial labor.

Often the patient's attire is in harmony with the title: uniforms of the oddest fancy, multicolored tinsels, numerous decorations, etc.

When the mental detcrioration is less pronounced, as, for instance, in certain cases of dementia præcox, the subject shows more logic in his conduct. He assumes an air of dignity, avoids all association with the other patients, and declines with a contemptuous smile all suggestion of employment.

Ideas of grandeur are also met with in certain acute psychoses, as in mania, for instance, and in certain forms of systematized delusional states without mental deterioration (*Paranoia originaire* of Sander).

CHAPTER IV

SYMPTOMATOLOGY (*Concluded*)

AFFECTIVITY—REACTIONS—CŒNESTHESIA—NOTION OF PERSONALITY

§ 1. Disorders of Affectivity

Pathological modifications of affectivity are encountered in the course of all psychoses. They always appear early, and often before any of the other symptoms.

The principal ones are:

(*a*) Diminution of affectivity: morbid indifference;
(*b*) Exaggeration of affectivity;
(*c*) Morbid depression;
(*d*) Morbid anger;
(*e*) Morbid joy.

Diminution of Affectivity.—In its most pronounced degree indifference involves all the emotions, as in extreme states of dementia (general paralysis and senile dementia in their terminal stages), in which it is associated with general mental deterioration. In less severe forms indifference is manifested by disappearance of the most elevated and the most complex sentiments, with conservation and often exaggeration of the sentiments of an inferior order. The altruistic tendencies are the first to become effaced, while the egoistic sentiments persist. Only the satisfaction of their material wants still concerns the patients and governs their conduct. Many take no interest during the visits of relatives in anything excepting the eatables brought to them; they eat as much as they can, fill their pockets

with the rest, and leave without taking the trouble to express their thanks or even to bid their visitors good-by.

Morbid indifference may be *conscious* or *unconscious.* In the first case it is realized by the subject as a painful phenomenon. The patients often say: "I have lost all feeling, nothing excites me, nothing pleases me, nothing makes me sad." Some complain of being unable to suffer. This state, which may be called *painful psychic anœsthesia,* is frequent at the beginning of psychoses and sometimes persists through the entire duration of the affection (involutional melancholia, depressed periods of recurrent psychoses).

In the second case, which is more frequent, the diminution of affectivity is not noticed by the patient. Such is always the case in states of dementia.

The changes of other mental faculties, such as memory and general intelligence, are not necessarily proportionate to those of affectivity. Notably in dementia præcox it is not rare to find fairly good memory and relatively lucid intelligence coexisting with complete indifference.

Exaggeration of Affectivity.—Often combined with indifference, as described above, exaggeration of affectivity is encountered in most mental affections, congenital and acquired. It constitutes the basis of irritable and changeable moods and of the extreme irascibility so often seen among the psychotic and among neuropaths in general.

In psychoses it is an early symptom, appearing at times long before the other phemonema. An individual previously calm, gentle, kind, becomes disagreeable, ill-natured, violent. "He is completely changed," is a remark often made by the relatives.

Irritability is almost always associated with variability of moods.

Disorders of affectivity characterize a large and important group of cases included under the somewhat vague designation of constitutional psychopathic states. In these subjects the emotions are entirely out of proportion with their causes. The death of an animal plunges them into

unlimited despair, the sight of blood brings on syncope, the most simple affairs preoccupy their minds so as to make them lose sleep. Sensitive in the highest degree, they see in everything malevolent intentions, disguised reproaches. But their sentiments, though very intense, do not last long; sorrows, enthusiasms, resentments, are with them but a short blaze.

Morbid Depression.—Depression presents itself in pathological states, as it does in the normal state, in two forms: active and passive. This distinction is founded upon the presence or absence, or rather upon the intensity, of *psychic pain*. While in active depression psychic pain is very prominent, in passive depression it is dull, vague, scarcely appreciable. Indeed, as Dumas says, "the element of pain is not absent in passive melancholia; but is it not an acute and distinct psychic pain. It is but vaguely perceived."[1]

Passive Depression.—The fundamental features of passive depression are lassitude, discouragement, resignation. It is always associated with a marked degree of *psychic inhibition*, *aboulia*, and *moral anæsthesia*, and may be complicated by delusions and hallucinations. It is accompanied by organic changes which have been extensively studied by physiologists (Darwin, Claude Bernard, Lange), and to which Dumas has devoted one of the most interesting chapters in his book, "*La tristesse et la joie*."

Depression is always associated with a state of peripheral and probably cerebral vaso-constriction, in which Lange believed he had found the immediate cause of this emotion. This vaso-constriction is apparent in the pallor of the skin, coldness of the extremities, and absence of the peripheral pulse, which are constant features of the depression of melancholia. The opinion of Lange is, however, too exclusive. "This vaso-constriction, which in the peripheral organs results in coldness and pallor of the tissues, brings about in the brain a condition of anæmia, undoubtedly contributing to the maintenance of the mental and motor

[1] *La tristesse et la joie*, p. 29. Paris, F. Alcan.

inertia; but it cannot be asserted positively that it is the *only* cause of these phenomena. Morselli and Bordoni-Uffreduzzi have shown long since, in fact, that the phenomena of depressed intellectual activity may appear before the cerebral circulatory changes; this leads to the conclusion that depression begins with being the cause of the circulatory changes before becoming subject to their influence."[1]

In the very rare cases in which, in spite of the peripheral vaso-constriction, the cardiac impulse retains its force, the blood pressure, according to the laws formulated by Marey, rises; this condition constitutes the first type of depression, depression with hypertension.

But almost always the heart participates in the general atony characterizing depression, so that the blood pressure falls in spite of the peripheral vaso-constriction: this constitutes the second type of depression, depression with hypotension (Dumas).

The *respiratory disorders* are no less constant than the circulatory ones. The respirations are shallow, irregular, interrupted by deep sighing. The quantity of carbon dioxide excreted tends to diminish.

The general nutrition is impaired; this results in loss of flesh, which is but slight if the depression lasts no longer than a few days, and which persists as long as the affective phenomenon itself. The weight does not return to the normal until the depression disappears, i.e., until the patient either recovers or becomes demented.

The appetite is diminished, the tongue is coated, the breath is offensive. The process of digestion is accompanied by discomfort and often by pain in the epigastrium. Finally, there is almost always constipation.

The sluggish metabolism shown by the diminished elimination of carbon dioxide is also apparent from the quantitative and qualitative changes in the urinary excretion. The quantity of urine voided in twenty-four

[1] *Dumas. Loc. cit.*, p. 239.

hours is diminished. The quantity of urea, as well as that of phosphoric acid, is also diminished. (Observations of Dumas and Serveaux.)

The toxicity of the urine in depression is undoubtedly of interest, but the results so far obtained are somewhat conflicting. According to some authors it is increased, according to others, diminished. This subject, still in a state of confusion, should be excluded from the domain of practical psychiatry.

Active Depression.—The special feature of active depression is *psychic pain,* which is distinct and sufficiently intense to render the subject subjectively conscious of it. The appearance of this new phenomenon modifies to a certain extent the fundamental symptoms which have been described in connection with passive depression.

Like physical pain, psychic pain tends to limit the field of consciousness, to exclude other mental manifestations, and to become what Schüle has designated by the term *pain-idea.* In certain cases the disturbance of consciousness which it causes results in marked disorientation and confusion. These phenomena, caused by the pain, become less marked as the pain becomes abated in intensity and disappear as the paroxysm passes off.

When psychic pain attains a certain intensity it results in *anxiety.* This phenomenon consists chiefly in a feeling of oppression or constriction, most frequently localized in the precordial region, occasionally in the epigastrium or in the throat, and more rarely in the head. This peculiar feeling is always accompanied by certain somatic phenomena, the most important of which are pallor of the skin, sometimes cyanosis, panting respiration, general tremor, irregular and accelerated pulse, and dilatation of the pupils.

Anxiety is frequently seen in the melancholias. It also occurs in cases of obsession. It may appear without cause in constitutional psychopaths (the paroxysmal anxiety of Brissaud).

From the standpoint of the reactions, psychic pain,

like physical pain, may manifest itself either by a sort of psychomotor paralysis—so that the patient remains immovable, with a haggard expression, silenced, so to speak, by the anxiety—or by various phenomena of agitation.

In the latter case, the more frequent, the pain, an active phenomenon, brings about a reaction which to a certain extent overcomes the fundamental psychic inhibition and manifests itself by two symptoms which are frequently seen together, motor agitation and delusions.

Acting as a stimulus, psychic pain overcomes the motor inertia of melancholia and gives rise to *melancholy agitation*, which is characterized by movements that are, in the normal state, the expression of violent despair. The patient wrings his hands, strikes his head against the wall, etc. The agitation of anxiety is essentially an expression of opposition, of resistance. The reactions are either automatic or governed by delusions: movements of flight, refusal of food, attempts of suicide, etc.

Suicide is one of the most formidable consequences of psychic pain. Though most melancholiacs have a desire to die, the aboulia which characterizes the state of depression very seldom permits them to carry out their desire. On recovering part of their energy they are apt to make suicidal attempts.

Delusions are a frequent but not constant manifestation of psychic pain. They are absent in certain cases of melancholia in spite of the existence of even very painful depression.

What is the mechanism of the production of delusions in melancholia? The most widely accepted opinion is that of Griesinger:[1] "The patient feels that he is a prey to sadness; but he is usually not sad except under the influence of depressing causes: moreover, according to the general law of cause and effect, this sadness must have a ground, a cause—and before he asks himself this question, he already has an answer: all kinds of mournful thoughts

[1] Griesinger. *Pathologie und Therapie der psychischen Krankheiten.*

occur to him as explanations; dark presentiments, apprehensions, over which he broods and ponders until some of these ideas become so dominating and so persistent as to fix themselves in his mind, at least for some time. For this reason these delusions have the character of attempts on the part of the patient to explain to himself his own state."

Though of great interest, this ingenious theory is perhaps somewhat too exclusive. Kraepelin has noted, in fact, that the delusions occurring in states of depression do not always present the character of explanations sought by the patient. Many melancholiacs instead of accepting the delusions, on the contrary reject them, at least in the beginning. Again, the appearance of a delusion does not bring with it the relative calm which would be expected if it really constituted the explanations sought by the patient. It seems, then, that this interpretation, ingenious though it is, is rather superficial. The view of Dumas appears to be nearer the truth. Psychic pain provokes delusions because it acts as a stimulus, struggling against the lassitude, and finally conquering it. Thus there is no logical relationship between psychic pain and delusions, but rather a dynamic one.

Morbid Anger.—Pain, associated with a representation of its cause, and sufficiently intense to overcome the psychic paralysis which is an essential accompaniment of depression, results in anger.

The violent and disordered reactions displayed in anger have a purely automatic origin, and are often associated with disturbance of consciousness and of perception which finds various expressions in popular language: a man who is a victim of violent anger is often said to be "beside himself," he "forgets himself."

Like all emotions, anger is accompanied by somatic changes. The principal ones are: increase of cardiac action and elevation of arterial tension; peripheral vaso-dilatation, chiefly noticeable in the face, which assumes a congested appearance; jerky and convulsive respiratory movements;

increase of most of the secretions; abundant salivation (foaming), more or less jaundice, diarrhœa, polyuria; sometimes suspension of the milk secretion; arrest of the menstrual flow; more or less marked cutaneous anæsthesia; general tremor.

Anger may be met with in all psychoses, excepting perhaps involutional melancholia. It sometimes reaches the intensity of furor, notably in idiots, epileptics, and other patients with profound disorder of consciousness. It is always associated with morbid irritability and impulsiveness, of which it is but an expression.

Morbid Joy or Morbid Euphoria.—This presents itself in two forms: one, a calm joy, analogous to passive depression; the other, an active, exuberant joy, analogous to active depression.

The first, when of average intensity, manifests itself by a state of satisfaction, a vague sense of well-being. It is encountered in general paralysis and in certain forms of tuberculosis. The optimism and astonishing contentment of some consumptives who have reached the last stage of their illness are well-known phenomena.

When calm euphoria reaches its highest development it becomes *ecstasy*, in which it is not accompanied by any motor reaction. Such is the case in certain forms of mystic deliria.

Much more frequent than this calm and tranquil form of euphoria, the *active* form, noisy, accompanied by motor reactions, is a constant symptom of the so-called expansive forms of psychoses: general paralysis with excitement, mania, certain toxic deliria.

Unlike depression, euphoria permits of easy association of ideas and quick motor reactions. These two phenomena do not always indicate real psychic activity. In fact most frequently in pathologic euphoria the associations formed are aimless, independent of all voluntary intellectual activity, and the motor reactions bear the stamp of impulsive acts originating automatically.

When pushed to a certain degree, the apparent rapidity of association develops into flight of ideas which has already been described.[1]

The aspect of the patient in euphoria is the direct opposite of that in depression. The expression is bright, smiling, with head raised and body upright. The speech is animated and accompanied by many gestures.

The concomitant physical phenomena are in general those of joy, that is to say, the reverse of those of depression. First come the cardio-vascular and respiratory phenomena: peripheral (and probably cerebral) vaso-dilatation, acceleration of the pulse, increased force of the cardiac impulse, and either elevation or lowering of the blood pressure, depending upon whether the increased heart action does or does not compensate for the peripheral vaso-dilatation.

The respirations are accelerated, deep and regular; the elimination of carbon dioxide is increased. The general nutrition is active, as is seen from the patient's gain in flesh and from the increase of excrementitious products in the urine.

These different phenomena, constant in normal joy and frequent in morbid euphoria, are, however, absent in some cases, when other factors are present which counterbalance the favorable influence of joy. Such is the case when there is intense motor excitement, which, in spite of the euphoria, causes a rapid loss of flesh. Such is the case also when the underlying condition is some severe bodily affection. The general paralytic or the consumptive with euphoria is none the less cachectic, for in such cases a generally flourishing state of health is not possible.

Certain anomalies are very difficult to explain. Some maniacs show, instead of an acceleration of the pulse characteristic of states of euphoria, a slowing which is at times quite marked. We have observed in a young maniacal

[1] See pp. 50 and 51.

girl with marked excitement less than forty-five pulsations per minute for several days.

§ 2. Disorders of the Reactions

The different psychic operations which we have so far considered—perception, association of ideas, affective phenomena—find their outward expression in the reactions. Like association of ideas, reactions may be of two kinds: *voluntary* and *automatic.*

Between a voluntary act accomplished in full self-possession and a purely automatic act there are all intermediate gradations; we pass from one to the other by gradual insensible transition. The participation of the conscious will diminishes as that of the automatism becomes more prominent, or inversely.

We have seen that in normal ideation voluntary and conscious associations tend to inhibit automatic associations. Similarly the conscious will tends to inhibit automatic reactions.

We shall study: (1) *aboulia,* or paralysis of voluntary reactions; and (2) *automatic reactions.*

Aboulia.—Complete paralysis of the will brings about, depending upon the character of the case, either stupor or absolute automatism. When less pronounced it is manifested clinically by a general sense of fatigue and discouragement, by slowness and unsteadiness of the movements, and by the painful effort that is necessary for the accomplishment of all spontaneous or commanded acts. The voluntary apparatus then resembles a rusty mechanism which works only with difficulty.

Like sluggishness of association, which in most cases accompanies it, aboulia is a manifestation of psychic paralysis.

Automatic Reactions.—These may be paralyzed in the same degree as voluntary reactions and give place to the absolute inertia of stupor; or, on the contrary, they may

become exaggerated by reason of weakening of the conscious will.

We distinguish: (A) positive automatic reactions; and (B) negative automatic reactions.

(A) *Positive automatic reactions* are expressed clinically by two phenomena: *suggestibility* and *impulsiveness.*

By *suggestibility* is understood a state in which the reactions are compelled by external impressions. Its most perfect expression is catalepsy, in which the limbs assume and retain the attitudes in which they are placed by the examiner. This phenomenon has been termed waxy flexibility (*flexibilitas cerea*).

Many patients appear to have lost all individual will and are reduced to mere automatons. Some repeat exactly the words (*echolalia*) or the gestures (*echopraxia*) of the persons around them. Others exhibit no spontaneous activity, but are able to execute without hesitation any command. Such is the case with hypnotized subjects, certain catatonics, etc. Sometimes it suffices to start them moving, when they will continue and accomplish a series of acts to which they are accustomed.

Suggestibility is the dominant note of the character of certain persons, mostly credulous and weak-minded, whose thoughts are governed by external impressions, whose will is nil, and who yield to the domination of the most diverse influences, good or bad. Many criminals belong to this class.

Impulsive reactions or *impulses* are to be divided into three groups: (*a*) impulses of passion; (*b*) simple impulses; (*c*) phenomena of stereotypy.

(*a*) *Impulses of passion* always depend upon abnormal irritability. They are determined by provocation that is often insignificant and are accomplished independently of any mental reflection. They are met with in a great many patients: constitutional psychopaths, epileptics, maniacs, etc. A maniac feels his neighbor give him a slight push; he immediately strikes him without reflecting that

the latter had no malevolent intention, that he was perhaps even unconscious of having touched him, etc. This is an impulse of passion.

(b) *Simple impulses*, purely automatic, appear without any emotional shock and without a shadow of provocation. One patient suddenly threw into the fire the gloves, hat, and handkerchief of her daughter who came to visit her at the sanatorium. Afterwards during a moment of remission she remembered perfectly the act and the circumstances under which it was accomplished, but was not able to furnish any explanation for it.

The impulse may be *conscious*. A patient is suddenly seized with a strong desire to steal some object from a show-window, the possession of which could be neither useful nor pleasant to him; he does not yield to this impulse, which he recognizes as pathological. This is a conscious impulse. This phenomenon is closely allied to imperative idea, of which it is but an accentuation.

(c) *Stereotypy* consists in a morbid tendency to retain the same attitude, or to repeat the same movement or the same words. Hence the three kinds of stereotypy:

Stereotypy of attitudes;

Stereotypy of movements;

Stereotypy of language: verbigeration.

Certain patients remain for hours at a time in most uncomfortable attitudes; others will walk a long distance, taking alternately three steps forward and two backward; still others will repeat indefinitely the same phrase or the same verse.

(B) *Negative Automatism*.—This forms the basis of negativism and consists in the annulment of a voluntary normal reaction by a pathological antagonistic tendency.

The patient is requested to give his hand; the voluntary reaction which tends to appear and which would result in compliance with the request, is arrested, suppressed by automatic antagonism. This disorder of the will has been designated by Kraepelin, who has made an admirable

study of it, by the term *Sperrung,* a word which, literally translated into English, means *blocking.* A more significant term perhaps would be *psychic interference.* The two antagonistic tendencies neutralize each other like interfering sound-waves in physics.

On a superficial examination negativism may resemble aboulia. These are, however, two very different phenomena. While the latter, purely passive, is the result of persistent paralysis against which the patient struggles with more or less success, the former, an active phenomenon, depends not upon paralysis but upon a perversion of the will. Negativism is often manifested only in certain kinds of reactions. One patient who walks about without any effort does not open his mouth. Another who dresses himself, eats unassisted, and even works, remains in complete mutism, making no response in spite of all perseverance on the part of the questioner.

In a more marked degree negative automatism results not only in the arrest of normal reactions, but also in the *production of contrary reactions.*

Thus if one attempts to flex the patient's head he extends it, and *vice versa.* If he is requested to open his half-shut eyes he closes them, and if the examiner attempts to force them open, his orbicularis muscle contracts in a veritable spasm. Wernicke observed that while *flexibilitas cerea* chiefly shows itself in the limbs, negativism mostly affects the muscle groups of the head and neck.

§ 3. Disorders of Cœnesthesia and of the Personality

Disorders of Cœnesthesia.—By cœnesthesia or vital sense is understood " the general feeling which results from the state of the entire organism, from the normal or abnormal progress of the vital functions, particularly of the vegetative functions " (Höffding). The stimuli which produce this

sense are vague and poorly localized, and are perceived not individually, but together as a whole.

The harmony which normally exists between the diverse organic functions produces a vague sense of satisfaction and of well-being. All causes tending to destroy this harmony will produce in consciousness a feeling of malaise and of suffering more or less definite and more or less acute. Thus the disorders of cœnesthesia are intimately connected with disorders of affectivity; most of the depressed states have for their basis an alteration of the vital sense.

Disorders of the Personality.—Alterations of the personality constitute the symptom which, following Wernicke, we have termed *autopsychic disorientation.*

These disorders may be arranged in three principal groups:

(*a*) Weakening of the notion of personality;

(*b*) Transformation of the personality;

(*c*) Reduplication of the personality.

(*a*) The *notion of personality* may be incomplete or absent; it may have never been developed at all, or it may have been but incompletely developed, as in idiots and imbeciles, or it may have disappeared or become weakened under the influence of a pathogenic cause, as in mental confusion, epileptic delirium, depression with stupor, etc.

(*b*) *Transformation of the personality* may be complete or incomplete.

In the first case the patients forget or deny everything pertaining to their former personality. Thus one patient claimed that she was Mary Stuart, wanted to be addressed as "Her Majesty the Queen of Scotland," and attired herself in costumes similar to those of that time. She became furious when called by her own name, and obstinately refused to accept the visits of her husband and children, whom she called "impostors." Another patient, afflicted with hysteria, believed herself to have been transformed into a dog; she barked and walked on all fours. Still

another patient at the Salpêtrière referred to herself as "the person of myself."

Complete transformation of the personality may be *permanent,* constituting, according to the excellent expression of Ribot, a true alienation of the personality; or it may be *transitory,* so that the new *ego* disappears at a certain time to be replaced again by the former *ego.* In cases in which the normal personality and the pathological one replace each other mutually several times we have variation by alternation.[1]

Incomplete transformation of the personality exists in a great many cases in which the patients are led by their delusions to attribute to themselves imaginary talents, powers, or titles, without at the same time completely abolishing their real *ego.* One patient suffering from a chronic delusional state of old standing claimed that he was St. Peter, and explained that he had been incarnated in an earthly man for the purpose of bringing happiness to mankind. A general paralytic claimed that he was Emperor of Asia, reigning in Pekin, being at the same time aware of the fact that he was living in Paris, and was a newspaper vendor.

(*c*) *Reduplication of the personality* consists in the development of a new personality of a parasitic nature alongside of the real personality of the patient.

This reduplication is the origin of the idea of possession so frequent in chronic delusional states and results in a psychic disaggregation the most important manifestations of which are autochthonous ideas (psychic hallucinations) and motor hallucinations. As we have had occasion to indicate above, the patient, feeling that he is losing control of his own thoughts and movements, concludes that a strange personality has taken possession of him.

[1] Ribot. *The Diseases of Personality.*

CHAPTER V

THE PRACTICE OF PSYCHIATRY

HISTORY TAKING—METHODS OF EXAMINATION

The data for diagnosis, prognosis, and treatment are obtained in psychiatry, as in other branches of medicine, from the case history and from the direct examination of the patient.

§ 1. History Taking

Information must be sought from all available sources and the various data checked against each other to insure accuracy as far as possible.

The patient himself, if able and willing to coöperate, can often furnish information that is of the most intimate kind and not to be had from other informants; this is especially true in regard to the sexual life and venereal infections. Besides, it is always useful to have a free expression of the patient's viewpoint, even if the statements made by him are incorrect.

Further information is to be sought from the patient's relatives and friends and, in a case presenting a history of previous admissions, from the records of the institutions in which he was treated.

Efforts to secure a case history should not stop here, as they do too commonly. It is now widely recognized that a satisfactory knowledge of the family history and of the nature of the environment, in the midst of which the patient has lived and developed his psychosis, is hardly to be had

without *field investigation*, affording opportunities of interviewing relatives, friends, neighbors, family physicians, employers, and others who do not visit the hospital; consulting public records of births, marriages, divorces, and deaths; and studying at first hand the home conditions.

These considerations, as well as others pertaining to social service and after-care of paroled or discharged patients, have led to the growing practice of employing *social workers* in institutions.

Family History.[1]—A full family history in a given case may be of value not only for a study of its etiology, but also for the assistance that is at times to be derived from it in the interpretation of clinical manifestations.

The questioning should be systematic, taking up members of the family individually, and covering wherever possible at least the patient's children, brothers and sisters, nephews and nieces, parents, and grandparents, uncles, aunts, and cousins on both the paternal and maternal sides.

For each member of the family it is desirable to place on record the name, sex, birthplace, age (or age at time of death), cause of death, education, occupation, and marital condition.

As special subjects of inquiry may be mentioned the following: *psychoses*, a description to be secured in each case of time and manner of onset, principal manifestations, course, termination, and recurrences; *epilepsy* and other disorders which seem to be related to it, namely, convulsions in childhood, fainting spells, migraine, and periodic dipsomania; *arrests of development*, as shown by delayed walking and talking not due to physical causes, poor record at school, lack of success in work; *suicide*, method and immediate cause to be given if known; the *milder psychoses*, "nervous prostration," and *psychoneuroses*, hysteria, neurasthenia, psychasthenia; *addictions* to alcohol or drugs, details to be

[1] C. B. Davenport, in collaboration with others. *The Family History Book*. Bulletin No. 7. Eugenics Record Office, Cold Spring Harbor, N. Y., 1912.

given of amounts and frequency of indulgence, periods of abstinence, etc.; *anti-social traits*, criminality, mendacity, prostitution, vagrancy, pauperism not dependent on physical causes; *temperamental anomalies*, such as undue irritability, spells of "the blues," worrisome or hypochondriacal disposition, excessive religious preoccupation, miserliness, and other eccentricities; *sexual anomalies*, especially perversions and inversions; and finally conditions like *asthma*, *sick headaches*, and *recurrent vomiting*, the relation of which, if there be any, to the neuropathic states, is not clearly established.

The fact of a sojourn for treatment or custody in a hospital, sanatorium, asylum, colony for the epileptic or fëeble-minded, or almshouse, or of imprisonment in a penal institution, should be recorded wherever ascertained with dates and other details.

In connection with cases of Huntington's chorea only similar heredity seems to be of significance; hence inquiry should be especially directed to other cases of chorea in the family.

In cases like juvenile general paralysis, the question of congenital syphilis may arise, which the family history should, of course, help to clear up.

It is not enough to state in each case merely the alleged fact of the existence of one or more of the above-mentioned conditions; but wherever anything of the sort is found a description in terms of the conduct and life course of the individual should be given, sufficient to establish the fact as alleged.

Personal History.—Here the main topics of inquiry are: (*a*) Were there any conditions during *intra-uterine life* (infections, eclampsia, traumatisms of the mother; hydrocephalus or other diseases of the fœtus), *at birth* (premature labor, difficult or instrumental delivery with resulting head injury), or in *infancy* or *childhood* (meningitis, whooping cough with intracranial complications) likely to interfere with the mental development? (*b*) Were there at any time prior to

the onset of the mental disorder any abnormalities in the patient's *constitutional make-up?* Convulsions in infancy, childhood, or later; fainting spells; delayed walking or talking; poor record at school, lack of success in work; anti-social traits (criminality, mendacity, prostitution, vagrancy); temperamental anomalies (undue irritability, spells of "the blues," worrisome or hypochondriacal disposition, seclusiveness, excessive religious preoccupation, miserliness, or other eccentricities); and sexual anomalies (masturbation, perversions, inversions).[1] (*c*) What were the patient's habits in regard to the use of *alcohol?* What has led to its use? (Domestic infelicity, being out of work, business reverses, sociability?) Was its use regular (daily, week ends) or only occasional? What were the beverages used? (Beer, wine, whiskey.) In what quantities were they used? Did he go on sprees? Did he become intoxicated, if so, how often? Did the drinking affect the patient's appetite or health in any way? Did it cause him to lose time from his regular occupation? A particularly detailed account should be obtained for the time immediately preceding the onset of the psychosis. (*d*) Detailed information should be sought concerning venereal infections, particularly *syphilis*; date and source of infection, manifestations; was treatment prompt? of what did it consist? was it thorough? was it systematic, prolonged, and serologically controlled? did the serological tests ultimately become and remain negative? (*e*) Did the patient ever suffer a *head injury?* Did he become unconscious either immediately following the injury or after an interval? How long did the unconsciousness last? What symptoms were observed after recovery of consciousness? Was there a fracture of the skull? Was the patient operated on? Did he eventually recover fully from the effects of the injury? (*f*) Obtain a description of the patient's bringing up, his sexual, domestic, marital, and

[1] August Hoch and G. S. Amsden. *A Guide to the Descriptive Study of the Personality.* N. Y. State Hosp. Bulletin, N. S., Vol. VI, 1913, p. 344.

business life with a view to determining whether there were any other pathogenic influences such as have already been mentioned in the chapter on Etiology under the heading of *incidental or contributing causes.*

History of Psychosis.—Were there any *previous attacks* of mental trouble? What were the cause, date and mode of onset, principal manifestations, course, duration, and outcome of each? What was the immediate *cause* of the present attack? The date of its *onset* and the manner, i.e., whether sudden or gradual? Earliest observed *manifestations? Principal features?* What, if any, was the *treatment* of the attack prior to the patient's admission to the hospital? What led to the patient's *commitment?*

In cases of constitutional psychoses a neuropathic family history and evidence of abnormal make-up are now generally accepted as accounting, in a measure, merely for the fact that a psychosis has occurred, but not as explaining why it occurred at the particular time when it did, nor its special content and other manifestations. A case history is imperfect which fails to connect specific environmental happenings with the development of symptoms, both chronologically and by content. It will be granted, of course, that in many cases, owing to a symbolic nature of the trends or reactions, the etiologic mechanism is veiled; but this should not prevent an attempt, at least, to seek out the connections which, it must be assumed, exist in every case.

§ 2. Methods of Examination

Physical Examination.—Height, weight (compared with usual weight), malformations (especially of skull), general state of nutrition, pallor (hæmoglobin estimation and cell count, if indicated), temperature, pulse, respiration, appetite, condition of the bowels, sleep, menstrual function; subjective complaints (vertigo, headache, pains, weakness); cyanosis, dropsy, jaundice, eruptions; scars or other evidences of old or recent injury. Heart, lungs, abdominal or-

gans, urine; vaginal examination; pulse rate at rest and after exercise; blood pressure. *Nervous system:* smell, hearing, taste, cutaneous sensibility; vision, errors of refraction, hemianopsia, ophthalmoscopy if indicated; nystagmus, strabismus; *pupils*—equal or unequal, regular or irregular in outline, reaction to light normal or sluggish or slight in excursion, reaction to distance; innervation of *facial muscles* —equal or asymmetrical; *grips* in the two hands—equal or unequal (dynamometer test); *strength of legs* (for test of weakness of one lower extremity have both lower extremities raised and held; the weaker limb will sink before the other); *coördination*—writing, buttoning coat, gait, Romberg sign, balancing power on either foot; *reflexes*—knee jerks, with and without Jendrassic reinforcement (normal, unequal, exaggerated, diminished, lost), ankle clonus, plantar reflex (Babinski sign), sphincter control; *tremors*—eyelids, lips, tongue, hands—fine, coarse, intention (handwriting); choreiform or athetoid movements; *speech*—stuttering, slurring, scanning (test phrases; third riding artillery brigade, particular popularity, Methodist Episcopal); *aphasia* (systematic examination if indicated); *convulsions*—frequency, loss or preservation of consciousness, localized, or general, with or without aura, biting of tongue, voiding of urine, followed by stupor or prompt recovery.

Mental Examination.[1]—Much of value can be learned on a patient's coming before the examining physician from his *general appearance*, *manner*, and *spontaneous utterances:* his appearance may be disheveled, neglected, untidy; he may seem dejected, or irritable, or happy, or apathetic; he may coöperate in the hospital routine, showing a more or less intelligent adaptation; or merely submit in a passive way to being undressed, bathed, etc.; or he may be resistive and violent; he may be taciturn or even mute, failing to respond to any question, or he may be talkative, protesting,

[1] Sommer. *Diagnostik der Geisteskrankheiten.* Berlin and Vienna, 1901.—Fuhrmann. *Diagnostik und Prognostik der Geisteskrankheiten.* Leipsic, 1903.

or complaining, or wailing, or merely commenting on things about him, perhaps showing disturbances in the flow of thought like distractibility, flight of ideas, incoherence, verbigeration.

The manner of the clinical examination proper will depend to a considerable extent on the nature of the case and the amount of coöperation. In an irresponsive, seemingly stuporous case, or in one presenting great excitement a complete mental examination is out of the question for the time being and can be attempted only after subsidence of the hyper-acute phenomena. It should be borne in mind, however, that a condition of seeming stupor may prove to be either one of marked depression or of catatonic negativism with well-preserved lucidity. A detailed record should be made of the condition found, especially of any unexplained peculiarities in attitude or conduct, to be discussed with the patient when better coöperation is to be had.

In cases offering reasonable coöperation it is of great advantage to proceed systematically. Some patients volunteer to tell their story as soon as they are brought into the examining room, which they should be, of course, encouraged to do; others will speak only when questioned, and then but briefly. In any case it is desirable, before actual testing is begun or any specific questioning concerning hallucinations or delusions, to get the patient's account of his trouble or at least of the situation which led to his commitment. Should he show, in the course of his account, a tendency to ramble from his subject, or any disconnectedness, or other disturbance of the flow of thought, then it is very useful to make an exact stenographic record of a sample of his utterances to the extent, say, of half a page or a page; that being done, he may be assisted by the examiner by being interrupted whenever necessary and reminded of the points on which he was asked to give information.

It is very important to have the patient at his ease as far as possible, not to arouse his antagonism or suspicion or apprehension. The only correct way of approaching him

is with perfect candor, letting him understand that the examiner is Dr. ———, a physician, a specialist in nervous and mental diseases, and that the object of the examination is to find out if he has not some such trouble.

Thus one may begin with such questions as, Tell me about your case; have you been sick? Did you have any trouble at home? Why have they brought you here? Have you been ill-treated?

As the next step the patient may be questioned about the statements in the commitment paper made to show insanity and necessity of commitment, and from that it is easy to pass to direct questions concerning hallucinations or delusions, following the leads made available by his account: Have you heard voices? Has anyone hypnotized you? Do people talk about you? Do they read your mind? Have you been poisoned? Are you followed by detectives? Is it true that you are very wealthy?

It goes without saying that any hallucinations or delusions that may be elicited should be gone into thoroughly: Do you hear the voices all the time or only occasionally? Are they distinct? Are they voices of men or of women? Familiar or strange? Where do they come from? Transmitted by some apparatus? What do they say? What do you do when you hear them? Do others hear them also or only you? Don't you think it is just imagination? Or, What makes you think you are being poisoned? Did you taste it in your food? Have you noticed any ill effects? Who is doing it? For what reason? For what object? What do you plan to do about it?

At this stage of the interview the examiner will probably already have gained some idea of the patient's orientation, memory, education, and mental capacity. But it is preferable to test these specially and by a uniform technique for all cases in order to obtain data for comparison. The following questions are recommended:

What is your name?
Where were you born?

In what year were you born?
What year is this?
How old does that make you?
What is your occupation?
Where do you live?
What is the name of this town or city?
How far is it from New York (or other notable city)?
What kind of an institution is this?
What date is to-day? What month? What day of the week?
Is this morning or afternoon?
Where did you come from? When?
How did you come (train, boat, trolley, carriage, walk)?
Did you come alone or with somebody?
What did you have for breakfast this morning?
Where were you yesterday?
Where were you a week ago?
Where were you last Christmas?
Where did you go to school? Can you name some of your teachers?
When did you leave school?
When did you begin work?
Who was your first employer?
Count backwards from 20 to 1.
$5+4$? $9+7$? $26+39$? 4×8? 5×12? 9×17?
Give the months of the year.
Name five large cities in the United States.
Where is London? Paris? Berlin? Vienna? Rome?
Who is the President of the United States? Who was the first President? What war took place while Abraham Lincoln was President?

Retention may be tested by giving the patient a number, or a name, or a phrase to remember (1473, physician's name, 238 Main Street), and asking him to recall it at the end of five minutes.

At some convenient time during the examination an attempt should be made to determine the degree of *insight* which the patient has in regard to the abnormal nature of his symptoms. It happens very seldom that a patient admits that he is insane, but this is hardly a proper criterion of insight; in fact where it does happen it is more apt to be dependent on a certain shallowness of personality and emotion than on a real preservation of auto-critical faculty.

Thus one imbecile was asked, Why did they send you here?—"They said I was crazy," he answered. Was that really so? he was asked again.—"I guess so," he said, grinning all the time.—What is of importance in this connection is to gain a precise idea to what extent the patient realizes the unusualness of his morbid experiences and behavior and their dependence, not necessarily on insanity, but on being "nervous," or "upset," or on "overwork," or "lack of sleep," or "drinking too much," etc.

Tests of *reading* and *writing* are also very useful.

The first consists in requesting the patient to read aloud some paragraph in a book or in a newspaper and then having him give an account of what he has read; his account is more or less accurate and complete. This test may demonstrate any existing disorders of (1) perception; (2) attention and association of ideas; (3) power of fixation; (4) speech (physical impediments).

A systematic study of the writings of psychotic patients is of the highest interest. The symptoms which such writings reveal are sometimes so clear as to be sufficient in themselves to characterize an affection, and in all cases they constitute valuable elements of diagnosis. Joffroy has very properly classified them into *calligraphic* and *psychographic* disorders. The former pertain to the handwriting as such, which may be more or less irregular, tremulous, hesitating, etc. The latter pertain to the content of the writing and reveal psychic abnormalities: weakening of attention (omission of words, syllables, or letters, errors of spelling due to inattention), weakening of memory (errors of spelling due to effacement of word images or to forgetting the rules of grammar), mental automatism (flight of ideas, incoherence, stereotyped repetition of letters, words, or phrases), and various delusions.

The writings constitute trustworthy, permanent documents which may be indefinitely preserved as evidence of the state of psychic (sometimes also of motor) functions of a patient at a given time. One may also, with the aid of the

data of graphic pathology and solely by means of examining the writings of a subject, follow in a certain measure the course of a mental disease the development of which is either progressive, as general paralysis, or cyclic, as some manic-depressive psychoses.

From the standpoint of symptomatology four kinds of writings may be distinguished: spontaneous writings, writings from copy, writings from dictation, and penmanship. Each has its special interest, as each enables us to study particular types of pathological phenomena. Spontaneous writings reveal chiefly the delusions of patients and are often of great value in cases of dissimulation. Writing from copy reveals disorders of attention, and writing from dictation reveals disorders of memory. Finally penmanship, which results from the patient's effort to produce the best possible handwriting, brings out motor disorders (tremor and ataxia).

Unfortunately the study of graphic pathology in order to be fruitful must go into certain details which could not be entered upon here for want of space. We must therefore limit ourselves to this brief discussion and refer the student to works in which this subject is specially treated.[1]

Having completed the examination it will be found very advantageous to prepare a *summary* of the findings which are of significance for diagnosis, prognosis, and treatment.

Many attempts have been made to simplify and standardize the work of clinical examinations by the use of printed blank forms. Experience has shown that to rely entirely on records thus prepared is not consistent with good clinical work. For a part of the records, however, it will be found

[1] Séglas. *Les troubles du langage chez les aliénés.* Bibliothèque Charcot-Debove.—Köster. *Die Schrift bei Geisteskrankheiten.* Leipzig, 1902.—Joffroy. *Les troubles de la lecture, de la parole, et de l'écriture chez les paralytiques généraux.* Nouv. Iconogr. de la Salpêt. Nov.-Dec. 1903.—J. Rogues de Fursac. *Les écrits et les dessins dans les maladies nerveuses et mentales.* Paris, Masson, 1905.

helpful to have a statistical data sheet or card such as is used in the New York state hospital service, somewhat like the following:

Patient's name in full........................Admission No.......
Date of admission............191 Race..............Sex.......
Residence.....................Date of birth....................
Marital condition (single, married, widowed, divorced, separated).
Occupation (or that of husband, father, or other person on whom patient is dependent).....................Citizenship (American, foreign).
Nativity (state or country)...........How long in U. S..........
Nativity of father.................of mother....................
Education (none, reads only, reads and writes, common school, high school, collegiate, professional). Religion (denomination)...........
Previous hospital residences (dates and duration of each)...........
....
Heredity..
Constitutional make-up (intellectually and temperamentally).........
....
Alcoholic habits..
Venereal history..
Other etiological factors...
Date and manner of onset of psychosis.............................
Diagnosis.....................Legal status (committed, voluntary)
Permission for autopsy in event of death..........................
Names and addresses of relatives, friends, or legal guardians.........
....
....

CHAPTER VI

THE PRACTICE OF PSYCHIATRY (*Continued*)

SPECIAL DIAGNOSTIC PROCEDURES: LUMBAR PUNCTURE —WASSERMANN REACTION—CHEMICAL TESTS—INTELLIGENCE TESTS—EXAMINATION FOR APHASIA—ASSOCIATION TESTS—OTHER TESTS—MEDICAL CONSULTATIONS

It is not to be supposed that the case history and clinical examination, obtained by the methods outlined in the preceding chapter, will complete the investigation of every case. Very often these methods afford but leads to further investigation by special methods according to the indications presenting themselves in the case under consideration. A suspicion of syphilis, for instance, can by no means be definitely dismissed by a denial made either by the patient or other informants; the differentiation between certain alcoholic psychoses, neurasthenia, arteriosclerotic dementia, and other conditions, on the one hand, and general paralysis, on the other, cannot always be made with certainty without the aid of special diagnostic procedures; the intellectual make-up of a patient cannot be determined with any degree of accuracy without resort to measurement by means of the Binet-Simon or other appropriate psychological tests.

Lumbar Puncture.—Lumbar puncture is a simple and harmless procedure. The only danger, that of infection, can be entirely avoided by the exercise of ordinary precautions of asepsis.

It is, however, contraindicated in cases of great general weakness and in those in which there is evidence of abnor-

mally high intracranial pressure (brain tumor). In such cases there is possibility of fatal issue.[1]

The examination of cerebro-spinal fluid obtained by lumbar puncture for purposes of psychiatric diagnosis usually consists of the following procedures: (*a*) cell count to determine presence or absence of pleocytosis, (*b*) Wassermann reaction, (*c*) chemical tests.

Cell Count.—Perhaps of greatest help in diagnosis is the cell count. The number of cells per cubic millimeter of spinal fluid varies considerably both in health and disease, and there is no definite point of demarkation between the two. Most pathologists consider any number under 5 as a negative finding, between 5 and 8 as doubtful, and over 8 as positive.

Where the clinical data would lead the physician to expect a positive finding while the actual finding is doubtful or even negative, the lumbar puncture may be repeated at the end of ten days. Either on first or second examination almost all cases of general paralysis and cerebral syphilis furnish a positive finding; other psychoses furnish, on the contrary, almost invariably a negative one.

Wassermann Reaction.—The Wassermann reaction has become an important aid, in some cases an indispensable one, in psychiatric diagnosis. It may be applied either to the blood or the cerebro-spinal fluid, or both, and may be of assistance (*a*) in differentiating psychoses of syphilitic nature from others, (*b*) to some extent in differentiating general paralysis from cerebral syphilis and from cerebral arteriosclerosis of syphilitic origin, and (*c*) in judging the effect of anti-syphilitic treatment.

Chemical Tests.—The chemical tests most widely used are Lange's colloidal gold test, Noguchi's butyric acid test, the Ross-Jones ammonium sulphate test and Pandy's phenol test. Their principal object is to determine the presence or absence of excess of certain protein substances in the cerebro-spinal

[1] See Minet and Lavoit. *La mort suite de ponction lombaire.* L'Écho Medical du Nord, Apr. 25, 1909.

fluid. They serve to differentiate general paralysis, cerebral syphilis, and other conditions associated with inflammatory changes in the central nervous system from conditions, organic or functional, which are not associated with such changes.

Intelligence Tests.—The importance of ascertaining a patient's constitutional make-up has already been pointed out. Anomalies of make-up may be either temperamental or intellectual. For a more accurate study of the latter a system of tests has been devised by Binet and Simon, constituting *a measuring scale of intelligence.* These tests have been applied to normal children of various ages and have thus been standardized, so that it is now possible by means of them to estimate the degree of mental development of a person in terms of the age at which such development corresponds to the normal average. The authors of these tests have taken special pains to eliminate the disturbing influence of education, having made it their aim to devise a measure of natural mental capacity and not of degree of training.

It should be mentioned that many objections have been raised to the Binet-Simon tests, some of which are directed more against their careless or inexpert use than against the principles on which they are based. On the other hand some inherent weaknesses have also been discovered, and many modifications of the tests have been developed intended to improve them.

Examination for Aphasia.—Cases of organic brain disease with lesions involving the speech areas and therefore presenting symptoms of aphasia require a special method of examination.

Association Tests.[1]—Association tests may be found

[1] G. Aschaffenburg. *Experimentelle Studien über Associationen.* Kraepelin's Psychologische Arbeiten, Vols. I, II, and IV.—C. G. Jung. *Diagnostische Associaziotionsstudien.*—Kent and Rosanoff. *A Study of Association in Insanity.* Amer. Journ. of Insanity, July and Oct., 1910.

useful in studying disturbances of flow of thought; they afford a means of measuring mental capacity somewhat like the Binet-Simon tests; and they have been used for the detection of subconscious ideas or complexes.

Other Tests.[1]—Many other tests, both physical and mental, have been more or less thoroughly standardized and are available both for clinical work and for psychiatric research.

The technique of the more commonly employed special diagnostic procedures of the psychiatric clinic will be found in Appendices I to VII in this book.

Medical Consultations.—The psychiatrist—especially one whose practice is mainly institutional—often finds himself in a position unlike that of other medical specialists: he is responsible not only for the diagnosis and management of the nervous or mental disorder which he is called upon to treat, but also, by force of peculiar circumstance, for the general welfare of the patient. If there is any abnormal condition of the eyes, ears, nose or throat; if there are decayed teeth, gynecological trouble, or surgical conditions requiring intervention; or if there is anemia, tuberculosis, diabetes, nephritis, heart disease, intestinal worms, or what not, he must see to it that they are brought to light and their nature exactly determined, and that they are submitted to appropriate treatment and as far as possible remedied.

He cannot, of course, be proficient in all medical specialties, but he can and should organize his clinical work in such a way as to be able to readily avail himself of consultation with other specialists whenever necessary.

[1] G. M. Whipple. *Manual of Mental and Physical Tests.* Second edition. Baltimore, 1915.—Woodworth and Wells. *Associotion Tests.* Psychol. Monographs, No. 57, Dec., 1911.—S. I. Franz. *Handbook of Mental Examination Methods.* Second Edition, New York, 1919.

CHAPTER VII

THE PRACTICE OF PSYCHIATRY (*Continued*)

APPLICATIONS OF PSYCHOLOGY IN PSYCHIATRY

Mental Measurements.—In psychiatry, as in other sciences, precise measurement and objective statement present great advantages. It is desirable to express whenever possible in quantitative terms the conduct and mental status of the patient. In this way errors of personal interpretation may be avoided and reliable comparisons made of conditions, individuals, and recorded observations of clinicians.

Thus, it is quite as possible to measure memory as it is to determine the pulse. To describe the former as " rather poor " is as inexcusable as to report the latter as " somewhat slow." Even such complex symptoms as incoherence, distractibility, retardation, dilapidation of school knowledge, lend themselves, with certain limitations, to measurement.

In the endeavor to express in precise language the deviations of conduct, capacity and experience, the psychiatrist finds frequent need for the employment of technique and materials elaborated by the psychologist.

Quantitative methods involve a considerable amount of time and a degree of professional skill which cannot be hastily acquired. In incompetent hands their results may be given a significance never vouched for by their elaborators, or they may fail to reveal the significant data potential in them. In slovenly and careless hands they may yield a false impression of accurate report. In the hands of the unprepared the

results of their use may often be set forth as conclusive without due regard to other significant factors. For such reasons it is desirable in practice for the expert psychologist to be consulted in his own field, just as are the chemist, toxicologist, and X-ray specialist.

Psychological measurement proceeds by providing uniform experimental situations or stimuli, establishing by preliminary research the normal or standard responses to these stimuli, and so scoring the subject's reactions that they may be graded in terms of achievement or of value.

Normal Curves of Distribution.—Measurements of mental traits have shown that individuals are distributed, with respect to them, according to the familiar curve of the probability integral. Human beings do not fall into sharply separated types or species, such as the slow and the fast, the elated and the depressed, the normal and the abnormal. Instead, in any mental trait that can be measured, the human family would be found to constitute but a single species, to fall within the limits of a normal curve of distribution. Such a curve of frequency means that all degrees of a given trait will be found to occur. Certain degrees of it, the median, modal or average degree, occur most frequently. Those individuals possessing this median degree of the trait, or deviating from it only by a stated amount, will constitute the typical. As one goes above or below this degree the individuals become gradually fewer and fewer.

In Fig. 1 are shown typical curves of normal distribution. Points on the base line or abscissa indicate in progressive order amount or degree of a given trait. Points on the ordinates indicate frequency of occurrence. *OY* on both curves represents the median or average degree of the trait as well as the fact of its most frequent occurrence. The lines *ab* and *cd* are equally distant from *OY*, and the area *abYcd* is one-half of the total area under the curve. The measure *aO* or *Od* represents average deviation and is technically known as Probable Error.

For example, the average educated adult performance in the well-known Tapping test is 376 reciprocal innervations in one minute. Half of the individuals of this class would fall within 37 taps above or below this average, i.e., between 339 and 413 taps. The number 37 is, then, the Probable Error of the distribution. Unusual or atypical performance would fall on the base line at a distance from the median greater than that represented by the Probable Error; the more unusual or atypical it is, the farther from the median it will fall.

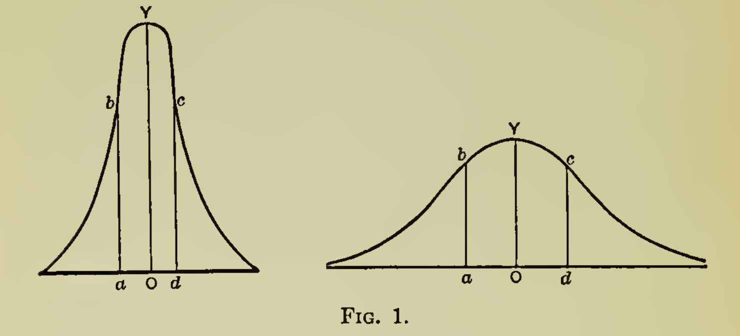


FIG. 1.

In a normal surface of frequency a distance of one Probable Error to one or the other side of the median includes 25% of the total number of cases. A distance of two Probable Errors includes an additional 17%; three, an additional 6%, and four, the remaining 2%, approximately, in each case.

Turning again to the Tapping test as an example, an individual who should be able to tap 450 times in a minute exceeds the average by 74 taps, which is double the Probable Error. He is thus two Probable Errors removed from the average in the direction of superiority. He would be excelled by only 8% of the group and would himself be number nine from the top if one hundred representative individuals were arranged in an order of tapping ability. It has thus been possible not only to measure his actual

tapping rate, but also to show what degree of deviation from the average the record indicates and the frequency of this capacity.

Measures Expressed in Terms of Maturity.—Another important method of measurement takes advantage of the fact that, up to a certain point in growth, achievement is a function of maturity. The average four-year-old child can repeat immediately after one hearing, a sentence of 12 syllables; the six-year-old, 17 syllables; the eight-year-old, 19 syllables; while at ten, thirteen, and sixteen years the memory spans are 21, 24 and 28 syllables respectively. That is to say, irrespective of other conditions, memory span is a function of age. This is true of most intellectual operations up to a point which ranges from 11 to 16 years, according to the nature of the process.

It is thus possible in the case of, say, an adult epileptic whose immediate memory enables him to repeat but 17 syllables, to say that, although he is chronologically an adult, his memory span is only that of an average six-year-old child. Other capacities or disabilities of a patient can similarly be expressed in terms of developmental units or years of growth.

During recent years rapid progress has been made in the standardization of capacity tests in terms of developmental units, and new standardizations are from time to time reported and adopted.

The ideal psychographic technique would call for standardized tests for each of those component factors which comprise that highly elaborate complex we call personality. Psychological research is still far from realizing this goal, but advance is being made so rapidly that close specialization of interest and cordial collaboration of psychiatrists and psychologists are required in order that satisfactory progress and application in this important field may be assured.

Intelligence Scales.—A notable step in the science of mental measurement was made by Binet and Simon when they attempted, on the basis of empirical investigation, to

extend miscellaneous achievement scales from the third year up through the later years of childhood and youth to maturity. Accepting a year of growth as a convenient unit of division, experimental research enabled these investigators to establish at each age level a group of intelligence tests which could be accomplished by the majority of children at that age, but failure in which characterized the average child of younger ages. Special effort was made to exclude such acts as would depend on education and training rather than simple psycho-physical growth.

The practical value of such an intelligence scale was readily appreciated, and the original scale soon underwent, at the hands of numerous investigators, such revisions, adaptations, extensions and wider standardizations as would render it more reliable and comprehensive. The most widely used scale is that known as the Stanford revision formulated by Terman and his associates. Directions for the use of the Stanford revision will be found in Appendix V, Part III, of this MANUAL.

Other adaptations, notably the Point Scale of Yerkes and his collaborators,[1] have been found useful by many workers.

Such intelligence scales, and the psychographic methods already discussed, afford the most reliable means of determining intellectual make-up and of revealing and measuring mental deficiency. In applying these tests to cases of psychotic conditions it is, of course, necessary to guard against mistaking temporary disability of acute psychotic states or acquired disability in states of dementia for inferiority of original mental endowment. In the presence of active psychotic manifestations these tests are not to be applied, but one should rather wait until the active manifestations have subsided and the patient is sufficiently composed to give full coöperation.

Group Tests.—The intelligence scales described above

[1] Yerkes, Bridges and Hardwick. *A Point Scale for Measuring Mental Ability.* Baltimore, 1915.

are used in individual examinations which require the devotion of half an hour to an hour or more to each subject. Many occasions arise in which it is desirable to make intellectual ratings of large numbers of individuals, for which purpose the time-consuming individual methods are inexpedient. Accordingly for the examination of army recruits, selection of industrial employees, classification of school children, etc., group tests have been devised. A number of standardized group tests will be found described in Appendix VII, Part III, of this MANUAL.

Limitations of group tests are obvious. Although success in them may be taken as reliable indication of the subject's mental competence, failure may be due to a great variety of factors. Illiteracy, sensory defect, unfamiliarity with the language of the instructions, physical impediment, and psychotic conditions may, in the intellectually competent, cause the showing to resemble that of the mentally deficient. For these reasons subjects who fail in group tests should always be submitted, before decision, to individual examination. Group tests afford a useful means of indicating those most likely to require closer individual study.

Association Tests.—The tests described up to this point relate chiefly to the intellectual or cognitive aspects of mental life, and deal mainly with capacity to achieve in those multifarious adaptations which have as their end product what we call intelligent conduct. There are, of course, many other traits of personality that have high psychiatric importance, and for which methods of measurement are also desirable. The relative strength of instincts and fundamental trends, the affective make-up, volitional characteristics, the focalization of effort, degree of accessibility, moral habits, character trends, the strength of determining tendencies, eccentricity of values—these and other noncognitive aspects of the mental make-up may assume a dominant rôle in the clinical picture. Measurement in these fields is far less advanced than in the determination of

intelligence and capacity, and the more strictly cognitive functions such as learning, memory, perception, language ability, judgment and reasoning. There are, however, certain valuable quantitative aids to diagnosis and description which it may often be advantageous to employ.

Association tests may be found useful in studying disturbances of the flow of thought, and they have been used in the technique of psychoanalysis. For whatever object employed, it would seem advisable to make use of a standardized procedure. For this reason the test developed by Kent and Rosanoff is recommended. This test has been applied to one thousand normal subjects, and all reactions thus obtained arranged in frequency tables for all stimulus words. The technique and the necessary tables are given in Appendix VI, Part III, of this MANUAL.

In this test normal subjects seldom give over 10% individual reactions; psychotic subjects very often give over 25%. Among the individual reactions are contained almost all those that are of pathological significance. Moreover, certain varieties are to be distinguished among the individual reactions which are more or less characteristic of the various clinical types of mental disorder.

Standards have also been made available for the ages of childhood from four to fifteen years. Feeble-mindedness is recognizable with the aid of this test, and its degree may be roughly determined by reference to the standards for normal children. This test is sometimes capable of revealing mental abnormality where other methods of examination yield only negative results.

Related to the association tests is the psychoanalytic technique. The examiner's familiarity with the case will suggest special stimulus words. These may be given together with those employed in determining community of ideas, being introduced, say, after every fifth or tenth one. In such cases it is also advisable to record in each instance the reaction time in fifths of a second by means of a stop-watch or kymograph. "Complexes" are said to be

indicated either by abnormal types of reaction or by lengthened reaction times.

Experimental Psycho-pathology and Pharmaco-psychology.—Further ways in which psychological methods may be utilized to advantage in fields bordering on psychiatry are to be found in the fields of psycho-pathology and pharmaco-psychology. Thus in recording the shifting phases of manic-depressive psychoses laboratory technique may enable the observer to derive quantitative measures of psychomotor excitement, retardation and inhibition. In the study of the immediate effects of toxic substances, which has since the early days of experimental psychology possessed a certain interest for the psychiatrist, stimulation, depression, inhibition, secondary reaction, latent period of action, and similar facts may be given definite and objective expression through the use of standardized capacity tests and other technical devices of the psychological laboratory. In this way also qualitative analysis of the incidence of the toxic influence may be furthered.

Educational Therapeutics.—Training in cases of mental deficiency and re-education in cases of mental deterioration may be expected to succeed only in so far as they conform to general principles of educational psychology, which govern here as well as in all learning. The specificity of habit formation, for instance, is fundamental; and efforts that do not take this into account are likely to meet with disappointment; success is attained only in so far as particular desirable habits are acquired and undesirable ones inhibited. The original nature of man, which bulks so large in discussions of general educational procedure, is no less important in educational therapeutics.

Theoretical Relations.—It may not be amiss to point out in theoretical as well as clinical relations the reciprocal influence of the concepts of psychiatry and psychology. Differential psychology, through its measurement of the degree and distribution of individual differences in mental traits, has exerted, along with other biological sciences, a

wholesome influence in modifying the older psychiatric concept of clinical entities. As regards the large group of constitutional disorders, it is more and more realized that the marked disturbances encountered in institutions and clinics represent only the extreme end of the curve of distribution of the symptoms involved. The frequent resort in recent years to such diagnoses as "allied to dementia præcox" and "allied to manic-depressive psychoses" marks the professional recognition of the many borderline cases intervening between the average and the extreme deviations. The wholesome tendency in modern psychiatry, to refuse to draw sharp lines of demarkation and to recognize many of the conditions met with in the psychiatric clinic as being anomalies of character rather than diseases in the ordinary sense of the word, is throughout supported by the findings of differential psychology.

On the other hand, modern psychology has been distinctly influenced by concepts originating or emphasized in the formulations and practices of psychiatry. The emphasis on psychogenic factors; the exposition of the mechanisms of adaptation, thought, and character formation; the insistence on the energic character of mental life and conflicts and resolutions of fundamental trends, so conspicuous in modern psychiatry, have had much to do with the advance of theoretical or general psychology from its old structural concepts to its more modern dynamic point of view.

CHAPTER VIII

THE PRACTICE OF PSYCHIATRY (*Continued*)

GENERAL THERAPEUTIC INDICATIONS: INSTITUTION—COMMITMENT—TREATMENT OF EXCITEMENT, SUICIDAL TENDENCIES, AND REFUSAL OF FOOD—PSYCHOTHERAPY—PAROLE AND DISCHARGE—AFTER-CARE.

There is no general treatment for all mental affections any more than there is for all affections of the stomach or kidneys. Certain therapeutic indications, however, are of such importance and arise so often that it will be advisable to make a general study of them.

Some pertain to the surroundings in which patients should be placed, others to certain particularly grave manifestations: excitement, suicidal tendencies, and refusal of food.

Surroundings; Institution; Commitment.— In most psychoses it is necessary to secure for the patient physical and mental rest and to relieve him as far as possible from his preoccupations, delusional or rational.

It is difficult to carry out these indications in the ordinary conditions of life. The difficulties are of a nature both physical and mental; physical, because only few families can afford the expense involved in the treatment of a psychotic patient at home; and mental, because the relatives, inexperienced in the treatment of mental diseases, are not likely to carry out properly all the orders of the physician, and may cause an aggravation of the patient's condition by yielding to his caprices, being under the impression that he must

not be contradicted, and by wearying him with attempts to reason with him or to divert his mind.

The removal to an institution is therefore in most cases inevitable.

All psychotic patients may be grouped in two classes: the inoffensive and the dangerous.

For the first class of cases the institution does not present any particular features and the admission of the patient is effected with no more formality than that into a general hospital.

The patients of the second class must be *committed;* this must be accomplished under the supervision and responsibility of a public authority, and entails certain formalities.

Of all these formalities only one is of interest to us here: the physician's certificate.

The certificate, intended to establish the legitimacy of the commitment, need not contain any detailed observations and does not necessarily involve a precise clinical diagnosis. It is of little importance here whether the patient does or does not present inequality of the pupils or abolition of the patellar reflexes. It is also unimportant whether he suffers from mania or from dementia præcox, as long as the symptoms which he presents render him a menace to himself, to others, or to the public peace.

The indications for commitment are chiefly to be based on the dangerous tendencies of the patient; a senile dement who is quiet and tractable can without any inconvenience be cared for at home or in a home for the aged; another who is on the contrary irritable and violent should be committed without hesitation.

In a general way the following symptoms should be considered as indications for commitment: impulsive tendencies; suicidal ideas, ideas of persecution and hallucinations which bring about violent reactions; states of dementia associated with phenomena of excitement.

The character and intensity of the symptoms should,

however, not be the only factors governing the action of the physician. He should also take into account their *probable duration*. If the mental disorder is not likely to persist for more than several days and has no tendency to recur frequently, commitment is not justifiable; such is the case in febrile deliria.

Transfer of the Patient to the Institution.—Undoubtedly it is the physician's duty to induce the patient to go to a hospital. Unfortunately this is not always easy or even possible when the question is one of commitment. This question, at times delicate, cannot of course have a universal solution.

TREATMENT OF EXCITEMENT

Perhaps the greatest progress in the therapeutics of mental diseases within the past twenty years has been in our methods for the treatment of excitement.

By degrees, means of restraint, always useless, often barbarous, have disappeared from institutions.

The methods employed to-day in combating excitement may be grouped under four principal heads:

Rest in bed;
Hydrotherapy;
Isolation;
Medication.

Rest in Bed.[1]—First used in melancholia (Guislain, Griesinger, Ball), rest in bed has been only recently adopted in the treatment of excitement. Magnan has introduced its use into France, after having shown the excellence of its effects and the relative facility of its employment.

Rest in bed presents the triple advantage of *saving the patient's strength, calming excitement, and facilitating supervision*. It is indicated in most of the acute psychoses and in the periods of exacerbation of chronic psychoses. Rest

[1] Pochon. Thèse de Paris, 1899.—Wizel. *Ann. méd. psych.*, 1901—Sérieux et Farnarier. *Ann. méd. psych.*, 1900.

in bed need not necessarily be constant to be efficacious, except in cases in which the gravity of the general condition requires it. It is well to allow patients to get up for two or three hours daily, using part of the time for outdoor walks, the duration of which is to be determined by the special indications in each case.

Rest in bed produces the best effects when carried out collectively in small dormitories containing not more than ten beds. The example of patients who have already submitted to this mode of treatment exercises a salutary influence upon newcomers and helps to induce them also to accept it. Under favorable conditions two or three days generally suffice for even a very excited patient to become accustomed to staying in bed, and to become calmed to a certain extent.

Though he may still persist in restless movements, he rarely leaves his bed, and when he does, he will return without difficulty upon the simple injunction of the nurse.

Hydrotherapy.—The *cold douche*, formerly much employed for calming excitement, has been abolished.

Of the various forms of hydrotherapy two are most frequently used: the wet pack and the continuous warm bath.

The *wet pack* is applied by means of a sheet soaked in cold water and closely wrapped around the entire body. Its duration varies from twenty minutes to several hours. If kept on too long it may cause attacks of syncope.

Continuous warm baths are of great service when rest in bed does not suffice to calm the patient. As generally used, their duration does not exceed five or six hours daily. Some physicians, however, have obtained good results from the *permanent* warm bath: the patient remains in the bath for days or weeks.[1] The bath tubs used for this purpose are equipped with a device for supplying a continuous flow of water at an even temperature; also with a canvas cradle for the patient to lie on and a canvas sheet for a cover.

[1] Sérieux. *Le traitement des états d'agitation par le bain permanent.* Revue de Psychiatrie, Feb., 1902.

Isolation.[1]—Much opposed of late, isolation presents, in fact, certain inconveniences, the greatest of which is leaving the patient by himself without constant supervision; it is absolutely contraindicated in patients with suicidal tendencies, and should not, as a rule, be employed until the other measures—rest in bed and prolonged baths—have been tried.

Nocturnal isolation consists in allowing the patient to sleep in a separate room, which should, of course, be conveniently accessible to the attendant; it is of great utility for certain chronic disturbed patients. Many a dement who makes a great deal of noise during the night in the dormitory will rest quietly when he is alone.

Medication.—We shall limit ourselves to the mention of those drugs which are most frequently used in states of excitement, and give several formulæ.

Opium and its derivatives are used in the psychoses; extract of opium in pills, aqueous solutions of morphine for subcutaneous injection, tincture of opium, etc.

The danger of forming the habit prevents their use in cases requiring prolonged treatment.

Chloral enjoys a merited reputation. It is administered in solution by the mouth in doses of from one to two grams, or per rectum in doses of from two to three grams.

Chloral hydrate........................	1 or 2 grams
Syrup of currant-berries..................	30 c.c.
Water, enough to make..................	60 c.c.

To be administered in one or two doses by the mouth.

Chloral hydrate........................	3 grams
Yolk of egg	1
Milk................................	120 c.c.

To be administered per rectum, preceded by a simple enema.

[1] Mercklin. *Ueber die Anwendung der Isolierung bei der Behandlung Geisteskranken.* Allg. Zeitschr. f. Psychiat., 1903, No. 6.

Chloral may be combined with bromides:

Chloral hydrate	1.5 grams
Potassium bromide	2 grams
Syrup of currant-berries	30 c.c.
Water, enough to make	80 c.c.

To be administered in one or two doses by the mouth.

Chloral should be absolutely prohibited in cases of heart disease.

Bromides may also be used alone in doses of from two to four grams.

Sulphonal, *trional*, and *tetronal* bring about calm and prolonged sleep in cases of moderate excitement, given in doses of one or two grams. They are usually administered in powders each containing one gram of any one of these hypnotics. One or two such powders, according to the case, is to be administered in the evening toward six o'clock the action of these drugs being slow.

Chloralose, *hypnal*, and *somnal* may also be of service.

Chloralose	20 to 60 centigrams

Given in a powder.

Hypnal	2 grams
Chloroform water	100 c.c.
Syrup of peppermint	30 c.c.

To be administered in two or three doses bv the mouth. (Debove and Gourin.)

Somnal	2 grams
Syrup of currant-berries	40 c.c.
Water	20 c.c.

To be administered like the preceding. (Debove and Gourin.)

Paraldehyde may be given by the mouth, by the rectum, or hypodermically in doses of from 2 to 5 grams. It is an

excellent hypnotic. Its only inconvenience is the disagreeable and persistent odor which it imparts to the breath.

Paraldehyde	2 to 5 grams
Rum	20 c.c.
Lemon-juice	1.5 c.c.
Simple syrup	30 c.c.
Distilled water	40 c.c.

To be administered in one or two doses by the mouth. (Debove and Gourin.)

Paraldehyde	4 grams
Yolk of egg	1
Milk	120 c.c.

To be administered in one dose per rectum, preceded by a simple enema.

Hyoscine hydrobromate or hydrochlorate is a very active drug and must be used with great caution. It may be administered in solution, in pills, or by subcutaneous injection.

Hydrochlorate of hyoscine	0.005 gram
Syrup of peppermint	30 c.c.
Water enough to make	120 c.c.

A tablespoonful every ten minutes until four doses have been given.

Hyoscine hydrobromate	0.02 gram
Water	20 grams

For subcutaneous injection. One ordinary hypodermic syringeful contains two milligrams of the drug. Half a syringeful is given at first; it is very rare that the sedative effect is not produced by a whole syringeful.

SUICIDAL TENDENCIES

Suicide among the insane is perhaps the greatest source of anxiety to the practical psychiatrist.[1]

All forms of mental alienation may give rise to ideas of

[1] Viallon. *Suicide et folie.* Ann. méd. psych., 1901.

suicide, but the first place from this standpoint belongs to psychoses of the depressed form (involutional melancholia. depressed phase of manic-depressive psychoses, certain forms of alcoholism, etc.).

Whatever the nature of the disease may be, ideas of suicide may result:

(*a*) From an imperative hallucination: a voice calls the patient to heaven, orders him to die in atonement for his sins, etc.;

(*b*) From a delusion: fear of death from starvation, of being afflicted with an incurable disease; some patients commit suicide to escape the imaginary persecutions of their enemies;

(*c*) From an unconquerable disgust for existence (*tædium vitæ*) or from an intolerable psychic pain;

(*d*) From a sudden impulse (catatonia);

(*e*) From a suggestion: family suicide, epidemics of suicide;

(*f*) From a fixed idea, the origin of which is inexplicable. Such is the case reported by Ferrari: An officer declared on several occasions that it was ridiculous to live beyond sixty years. On the last day of his sixtieth year, after having passed a merry evening with his friends, he announced his intention of committing suicide, went into his room, and shot himself with a revolver.

The smallest objects may become in the hands of patients deadly weapons which they may turn against themselves. Magnan reported a case of a melancholiac who perforated his heart by means of a needle measuring scarcely 3 centimeters in length. Some patients at times resort to procedures so horrible that their use cannot be explained otherwise than by the existence of marked anæsthesia; thus a patient of Baillarger's applied his forehead to a red-hot plate of iron.

In institutions, where the patients are not allowed to have in their possession any dangerous instruments, the means most frequently made use of is *hanging*, which

fact is explained by the extreme simplicity of the procedure.

Together with suicide may be classed the *self-mutilations* which patients frequently commit.

Insane patients have been known to cut off their own fingers, lacerate or even cut off their genital organs by means of pieces of glass, open their abdomens, etc.

The *treatment* of suicidal tendencies is reduced to strict and constant watching, which should be instituted as soon as the existence of such tendencies is suspected, and continued for a long time after their apparent disappearance. As we have already stated above, isolation is absolutely contraindicated. Keeping the patient in an observation ward and rest in bed during the acute periods are very useful measures.

REFUSAL OF FOOD

Refusal of food [1] may result from:

(*a*) Delusions with or without coexisting hallucinations: fear of being poisoned or of not being able to digest the food; hypochondriacal ideas;

(*b*) The desire to starve to death;

(*c*) An unconquerable disgust for food;

(*d*) Negativism (catatonia, general paralysis).

Refusal of food may be *partial* or *complete.* Some patients will accept only certain kinds of food, often because these appear to them to be the safest or because "the voices" order them so. One patient lived solely on eggs, the shell seeming to him to be the only impenetrable barrier to the mysterious agencies used by his persecutors. One precocious dement would take no nourishment other than stale bread because a voice from heaven commanded him to do penance by fasting.

It may be also *absolute* or *relative.* Often with a little

[1] Pfister. *Die Abstinenz der Geisteskranken und ihre Behandlung.* Freiburg, 1899.

perseverance one may persuade a melancholiac to accept a sufficient quantitity of nourishment in a convenient form. Some catatonics refuse what they have been offered and several minutes later devour their neighbor's meal without there being any delusion to explain their conduct. Others refuse to eat, but when food is placed in their mouth they swallow it without trouble. Many even submit with the best grace to being fed with a spoon or with a feeding cup.

When refusal of food threatens to have a bad effect upon the health of the patient, as is shown by loss of weight determined by regular weighings, one must resort to forced feeding or " tube-feeding."

Tube-feeding may be accomplished in two ways: by the *mouth* and by the *nose*.

Tube-feeding by the mouth is the less painful and less dangerous procedure for the patient as well as the more convenient one for the physician.

The necessary instruments are a *mouth-gag*, a *stomach-tube*, and a *funnel* of glass or rubber.

The operation itself is performed in four stages:

(1) Opening the mouth;

(2) Introducing the tube into the stomach;

(3) Attaching the funnel to the tube and ascertaining the proper penetration of the tube into the stomach;

(4) Introducing the liquid food.

The first stage presents several difficulties due to the resistance of the patient, which is sometimes very great. However, by dint of patience and by taking advantage of little interstices between the jaws it is usually possible to accomplish this.

The introduction of the tube is usually easy. The end entering the pharynx sets up reflexly the movements of deglutition, so that the instrument of itself enters the œsophagus. A gentle push suffices to make it enter the stomach.

Although the large size of the tube renders a false passage almost impossible, the purpose of the third stage is to ascertain that the tube is well in place and has not entered the

trachea. Two procedures are used to make sure of this: auscultation at the opening of the funnel and introduction into the tube of several drops of pure water. If the noise produced by the gases of the stomach is heard, and if the water runs down freely, the tube is in place and is not obstructed. Otherwise the tube must be withdrawn and cleaned and the operation recommenced.

The liquid nourishment should always be introduced at a low pressure. Its composition may vary according to individual cases. Milk, eggs, beef-juice, peptones, or vegetable soups usually constitute the basis.

Tube-feeding through the *nasal* passages presents several inconveniences:

(1) It is painful;

(2) It often causes irritation and inflammation of the nasal mucosa;

(3) The small size of the tube renders its penetration into the larynx liable to occur, and does not allow the use of any but perfectly liquid food.

This method of feeding should, therefore, not be resorted to except in special cases, such as those of buccal affections interfering with the introduction of the tube by the mouth. In such cases a properly sterilized nasal tube or large-sized catheter is used; its end is lubricated with sterilized vaseline, and the operation is then accomplished in three stages:

1. Introduction of the tube through the nasal fossæ; this is effected without difficulty. No force should be used, one nasal fossa may be found to be obstructed owing to a deviation of the septum, a growth, or swelling from any cause: the tube may then be introduced through the other nostril.

2. Passing the end of the tube through the pharynx. This is a most delicate procedure. Owing to reflex contractions or to voluntary efforts on the part of the patient the tube is very apt to become coiled up in the throat, eventually to be expelled by way of the mouth; it must then be withdrawn and the operation recommenced. This

can, in a measure, be prevented: as the end of the tube enters the pharynx a little water may be poured either into the funnel or into the patient's mouth; this starts up movements of deglutition by which the end of the tube is directed into the œsophagus. As stated above, the tube may enter the larynx and trachea: as soon as that happens all groaning and talking stops and with each respiratory act air rushes in and out of the tube with a sucking and blowing noise; the tube must then be partly withdrawn, until the end is released from the larynx. This is not so apt to occur if the patient's head is raised by two pillows: in that position the direction of the pharynx is more nearly in line with that of the œsophagus, whereas when the head is hyper-extended the direction of the pharynx is more nearly in line with that of the larynx and trachea; even the voluntary act of swallowing is, in this latter position, as everyone knows, difficult.

3. Descent of the tube down the œsophagus and its penetration into the stomach. The small size of the tube renders it liable to be expelled by an effort of vomiting. This does not happen with a stomach tube such as is used in tube-feeding by the mouth. By using a tube which is sufficiently stiff this can usually be prevented.

Not infrequently after tube-feeding the patient rejects the contents of the stomach either spontaneously or by a voluntary effort. This may often be prevented by throwing a few drops of water in his face. In cases of obstinate vomiting the irritability of the stomach mucosa may be diminished by introducing with the liquid food several drops of a solution of cocaine.

It may be useful to precede the feeding by lavage of the stomach.

PSYCHOTHERAPY

Psychotherapy is the use of psychic factors in the treatment of disease.

An essential element of psychotherapy is suggestion. Its successful practice is dependent on the nature of the dis-

order, the attitude of the patient, and the personality of the physician.

The psychoneuroses are most amenable to psychic treatment. The graver psychoses are much less readily influenced.

The patient must have full confidence in the physician and in his methods. "The nervous patient is on the path to recovery as soon as he has the conviction that he is going to be cured; he is cured on the day when he believes himself to be cured."[1]

It follows that the physician must be able to inspire respect and trust. According to Griesinger[2] he must have "a kind disposition, great patience, self-possession, particular freedom from prejudice, an understanding of human nature resulting from an abundant knowledge of the world, adroitness in conversation, and a special love of his calling."

As to the manner of employing suggestion the indications must be sought in the individual case. In some cases, the patient's faith being strong, a mere statement that the symptoms are quickly disappearing may be sufficient. In other cases "rational" suggestion with an explanation of the cause of the symptoms and of the best means of combating them is more effective. "There is a great difference in mentality between the man who is content with a statement, who allows himself to be under the influence of the personality of a healer, and the man who acquires confidence by the clear exposition of the reasons to believe."[3] In still other cases hypnotic suggestion affords good results.

The following practical advice, evidently borne of abundant experience, is given by Dercum:

> "The physician should not be too aggressive with his suggestions, especially in the beginning. Indeed, his attitude should be that of accepting the illness and symptoms of the patient as a matter of course.

[1] Paul Dubois. *The Psychic Treatment of Nervous Disorders.* English translation by Jelliffe and White. New York, 1905. P. 210.

[2] Quoted by Kraepelin. *Psychiatrie.* Seventh edition. Vol. I.

[3] Paul Dubois. *Loc. cit.*, p. 227.

The mere institution of rest and the various physiological procedures, is a proof to the patient of the sincerity of the physician. It is only after the treatment has been established and has been under way for some time that the physician should begin a really serious psychotherapy. He should never be in a hurry to begin. The mistake may be beyond remedy, at least, so far as *he, individually,* is concerned. Time must be allowed for the patient to 'settle down,' i.e., to adapt herself to her new environment, her nurse and her physician. Very soon the luxuriousness and exquisite physical comfort of a properly instituted rest treatment makes its impression upon the patient. As the days go by, the physician and the patient gradually become better acquainted. The nurse, too, learns the little personal peculiarities of her patient, all of which she faithfully communicates to the physician. Very soon opportunities occur for more lengthy conversations, and the physician being now thoroughly *en rapport* with his patient and having fully gained her confidence, can venture to make free use of suggestion. Indirect suggestion, we will say, has been employed from the beginning, but direct suggestion, explanatory and logical in form, can now be employed with great effectiveness. Sometimes the conversations with the patient reveal the way in which this or that special symptom arose, and this clue may be of value in its subsequent disposal; the physician may point out the inadequacy of the cause alleged and at the same time 'explain away' the symptom." [1]

Special mention should be made of religious influences, which are of extraordinary efficacy in some cases. Cures produced by pilgrimages to shrines or by the practice of Christian Science are instances in point. Equally striking are the cures of habits of intemperance produced by religious conversion or, among good Catholics, by taking the pledge of total abstinence. In these, as in other measures of psychotherapy, the active principle is suggestion and therefore the existence of strong faith is a condition necessary for success.

In cases of mental deterioration the object of psychotherapy is re-education, not with the hope of bringing about recovery, but with that of training the subject to do some simple yet productive labor (basket weaving, mat making, chair caning, sewing, farm labor, etc.).

[1] F. X. Dercum. *Rest, Suggestion, and Other Therapeutic Measures in Nervous and Mental Diseases.* Second edition. Philadelphia, 1917.

Delusional states are notoriously refractory to suggestion or reason. Yet in selected cases, in which the delusional system is, so to speak, of a parasitic nature, not essentially a function of a vicious mental organization, something may be accomplished when a favorable opportunity presents itself of demonstrating to the patient the incorrectness of his belief.

I shall quote from the published autobiography of a man who had suffered from a severe and prolonged manic-depressive psychosis from which he subquently recovered.[1]

This man had developed a complex system of delusions of persecution by detectives. Within the space of a fraction of a minute he succeeded in fully correcting all his false ideas when he found convincing proof that he whom he had regarded as his brother's double and a detective was indeed his true brother.

"I dared not ask for ink, so I wrote with a lead pencil. Another fellow patient in whom I had confidence, at my request, addressed the envelope; but he was not in the secret of its contents. This was an added precaution, for I thought the Secret Service men might have found out that I had a detective of my own and would confiscate any letters addressed by him or me. The next morning, *my* 'detective' (a fellow patient who had the privilege of going and coming unattended) mailed the letter. That letter I still have, and I treasure it as any innocent man condemned to death would treasure a pardon or reprieve. It should convince the reader that sometimes an insane man can think and write clearly. An exact copy of this—the most important letter I ever expect to be called upon to write—is here appended:

August 29, 1902.

"Dear George:

On last Wednesday morning a person who claimed to be George M. Beers of New Haven, Ct., clerk in the Director's Office of the Sheffield Scientific School and a brother of mine, called to see me.

"Perhaps what he said was true, but after the events of the last two years I find myself inclined to doubt the truth of everything that is told me. He said that he would come and see me again sometime next week, and I am sending you this letter in order that you may

[1] C. W. Beers. *A Mind that Found Itself.* 1908. New York Longmans, Green and Co.

bring it with you as a passport, provided you *are* the one who was here on Wednesday.

"If you did not call as stated please say nothing about this letter to anyone, and when your double arrives, I'll tell him what I think of him. Would send other messages, but while things seem as they do at present it is impossible. Have had some one else address envelope for fear letter might be held up on the way.

Yours,
CLIFFORD, W. B.

"Though I felt reasonably confident that this message would reach my brother, I was by no means certain. I was sure, however, that, should he receive it, under no circumstances would he turn it over to any one hostile to myself. When I wrote the words: 'Dear George,' my feeling was much like that of a child who sends a letter to Santa Claus after his faith in the existence of Santa Claus has been shaken. Like the skeptical child, I felt there was nothing to lose, but everything to gain.

"The thought that I might soon get in touch with my old world did not excite me. I had not much faith anyway that I was to re-establish former relations, and what little faith I had was almost dissipated on the morning of August 30, 1902, when a short message, written on a slip of paper, reached me by the hand of an attendant. It informed me that my brother would call that afternoon. I thought it a lie. I felt that any brother of mine would have taken the pains to send a letter in reply to the first I had written him in over two years. The thought that there had not been time for him to do so and that this message must have arrived by telephone did not then occur to me. What I believed was that my own letter had been confiscated. I asked one of the doctors to swear on his honor that it really was my own brother who was coming to see me. He did so swear, and this may have diminished my first doubt somewhat, but not much, for abnormal suspicion robbed all men in my sight of whatever honor they may have had.

"The thirtieth of the month was what might be called a perfect June day in August. In the afternoon, as usual, the patients were taken out of doors, I among them. I wandered about the lawn, and cast frequent and expectant glances toward the gate, through which I believed my anticipated visitor would soon pass. In less than an hour he appeared. I first caught sight of him about three hundred feet away, and, impelled more by curiosity than hope, I advanced to meet him. 'I wonder what the lie will be this time,' was the gist of my thoughts.

"The person approaching me was indeed the counterpart of my brother as I remembered him. Yet he was no more my brother

than he had been at any time during the preceding two years. He was still a detective. Such he was when I shook his hand. As soon as that ceremony was over he drew forth a leather pocket-book. I instantly recognized it as one I myself had carried for several years prior to the time I was taken ill in 1900. It was from this that he took my recent letter.

" 'Here's my passport,' said he.

" 'It's a good thing you brought it,' said I coolly, as I glanced at it and again shook his hand—this time the hand of my own brother.

" 'Don't you want to read it?' he asked.

" 'There is no need of that,' was my reply. 'I am convinced . . . '

"This was the culminating moment of my gradual readjustment. . . . In a word, my mind had found itself."

The subject of psychotherapy is of too great a magnitude to be given full discussion here. The general lines of procedure have already been indicated. A special consideration of psychotherapy in application to the psychoneuroses will be found in the chapter devoted to these conditions in Part II, of this MANUAL. For fuller guidance in practical psychotherapy the student is referred to the work of Dubois.[1]

A special system of psychotherapy has developed in recent years out of the labors of Freud and his pupils. A presentation of this system will be found in the chapter on Psychoanalysis.

PAROLE AND DISCHARGE—AFTER-CARE

A patient who presents no dangerous or troublesome tendencies and who has improved sufficiently to justify his trying to live outside again may be, according to the growing custom of modern institutions, paroled in the custody of relatives or friends for a period which varies but which in the New York state hospital service may be as long as twelve months. If during the parole period his condition requires a return to the hospital no legal procedure for recommitment is necessary; he may be returned by his custodians or by attendants sent from the hospital. If he gets

[1] Paul Dubois. *The Psychic Treatment of Nervous Disorders.* English translation by Jelliffe and White. New York, 1905.

along well during the entire period of his parole he is automatically discharged at its expiration.

No test, no method of examination affords a fairer or more trustworthy and practical means of judging a patient's ability to get along outside of an institution. It is not strange therefore that the practice of paroling patients has become common in all institutions. Thus on June 30, 1918, the number of patients out on parole from the thirteen New York state hospitals was 1890.

The parole system may thus be seen to constitute an important extension of institutional activity. This, as well as the need of further care even for discharged patients, renders advisable for every institution or system of institutions the organization of systematic after-care.

When a patient has recovered from his mental trouble and has been paroled or discharged from the hospital the treatment of his case must not be regarded as finished, for there is still to be dealt with *an extreme liability to recurrency.*

Of a total of 8700 cases admitted to the New York state hospitals during the year ending June 30, 1918, 1903 were cases of readmission.[1] That is to say, that minute fraction of the population which consists of patients discharged from state hospitals has contributed 21.9% of all the admissions.

To what extent is recurrency preventable?

(1) In some cases recurrency must be regarded as probably inevitable, though perhaps it can be staved off by general hygienic measures; such are cases of general paralysis in remission and some manic-depressive psychoses.

(2) In other cases, in which, in addition to a strong predisposition to mental disturbance, there is a history of some *removable exciting cause* in the etiology of the first attack, recurrency may often be prevented by avoidance of re-exposure to the original exciting cause. It is true that in many of these cases some cause, other than the original exciting cause, may give rise to recurrency owing to special

[1] Thirtieth Annual Report of the N. Y. State Hospital Commission Albany, 1919.

vulnerability of the patient's mental organization. Yet it cannot be doubted that in a good proportion of these cases prophylactic measures could prove very successful. Among the common avoidable causes may be mentioned: loss of employment, overwork, inanition and exposure due to poverty, childbirth, and neglected somatic disease.

(3) In still other cases in which the trouble is due chiefly to some avoidable cause, *recurrency can be absolutely prevented.* This is a large group of cases consisting of the alcoholic psychoses, morphinism, cocainism, etc.

The problem of after-care with a view to the prevention of recurrencies is being met in most hospitals through outpatient clinics and social service departments.

CHAPTER IX

THE PRACTICE OF PSYCHIATRY (*Continued*)

PSYCHOANALYSIS [1]

MENTAL phenomena, like physical ones, arise not spontaneously or at random, but from adequate causes in accordance with natural law; i.e., here, as elsewhere, applies the doctrine of *determinism.*

Mental disorders present to the student two aspects: *form* and *content.* The chapters in this MANUAL dealing with symptomatology are devoted to a consideration of forms of disorder. For an understanding of the particular factors at work in a given case and for the more purposeful planning of psychotherapy a study of content must also be made.

Such a study must concern itself not merely with the patient's unguided formulations, but with a systematic probing for psychic factors many of which have passed beyond his present recollection or awareness. This is the particular task of *psychoanalysis.*

The Realm of the Unconscious.—One's field of consciousness is at all times limited; in other words, the number of representations within the scope of actual awareness at any given moment is small in comparison with one's total mental content. The readiness with which stored impressions can be recalled varies. There are probably many factors on

[1] A. A. Brill. *Psychanalysis: Its Thearies and Practical Applicatian.*—C. G. Jung. *The Theary af Psychaanalysis.*—E. Jones. *Papers on Psychoanalysis.*—O. Pfister. *The Psychoanalytic Method.* English translation by C. R. Payne.—S. E. Jelliffe. *The Technique af Psychoanalysis.*

which this variation depends, but one of these is of special interest for psychoanalysis—the factor of *repression.*

Ideas are charged with affect. In cases in which this affect is of a painful kind the ideas may be repressed, i.e., relegated to the realm of the unconscious by a protective mechanism.

That which is in the unconscious is not without influence on behavior. The latter is, indeed, for the most part motivated by unconscious factors. Notably repressed ideas, wishes, or "*complexes*" influence behavior, and sometimes in such a way as to produce pathological manifestations, either by *transference* of affect energy from the painful idea to one assimilable in consciousness (phobias, obsessions), or by *conversion* into a somatic manifestation (*tremor, aphonia, paralysis*).

Many repressed ideas or complexes are of a sexual nature. Mental disorders are very often manifested or produced by sexual maladjustment, and it is therefore incumbent on the student of psychiatry to make careful study of the subject of sexuality.

Sexual Theory (Freud).—Elements of sexuality are present from birth. "It rather seems to us that the child brings into the world germs of sensual activity and that even while taking nourishment it at the same time also enjoys a sexual gratification which it then seeks to again procure for itself through the familiar activity of thumb-sucking." "This manifestation does not yet know any sexual object, it is auto-erotic and its sexual aim is under the control of an erogenous zone."[1] Thumb-sucking is but one example of pleasurable excitation observed in infancy. Almost any part of the skin or exposed mucous membrane may serve as an erogenous zone, especially the anal and genital regions: "Children utilizing the erogenous sensitiveness of the anal zone can be recognized by their holding back of fecal masses

[1] This and other quotations in the section devoted to the sexual theory are from S. Freud. *Three Contributions to the Sexual Theory.* English translation by A. A. Brill.

until through accumulation there result violent muscular contractions."

When the genital region plays the part of an erogenous zone infantile onanism develops, consisting of rubbing with the hands or closure of the thighs—the latter especially in little girls. It should be noted that the genital region plays no such part here as it is destined for in adult life, but merely on a par with other infantile erogenous zones.

Around the fifth year of life sets in a period of *sexual latency*. The infantile tendencies are gradually *repressed* through the development of such psychic forces as loathing, shame, and moral or æsthetic sense, partly in the process of bringing up and partly by constitutional determination. In this period the sexual energy is not lost but diverted toward other aims by a process which has been termed *sublimation.*

In later childhood sexual activity is very apt to return either in the form of masturbation or a pollution-like process. " Most of the so-called bladder disturbances of this period are of a sexual nature; whenever the enuresis nocturna does not represent an epileptic attack it corresponds to a pollution."

" It is instructive to know that under the influence of seduction the child may become polymorphous-perverse and may be misled into all sorts of transgressions. This goes to show that it carries along the adaptation for them in its disposition."

At puberty, as all know, a radical transformation takes place. (1) The primacy of the genital zones over other erogenous zones is established. (2) A new phase of sexual pleasure appears, constituting the chief sexual aim—the *end-pleasure*, accompanied by relief of tension; this being added to the *fore-pleasure*, which gives rise to tension. It is to be borne in mind that the latter alone characterizes infantile sexuality and that normally it persists in but rudimentary form in adult life. (3) In girls a shifting takes place of the leading zone of erogenous excitability from the clitoris to the vagina, accompanied, in the psychic sphere,

by a new wave of repression which concerns clitoris sexuality.

The developmental changes described above affect the *sexual aim.* Other changes take place simultaneously, affecting the *sexual object.* "While the very incipient sexual gratifications are still connected with the taking of nourishment, the sexual impulse has a sexual object outside its own body, in the mother's breast. This object it loses later, perhaps at the very time when it becomes possible for the child to form a general picture of the person to whom the organ granting him the gratification belongs."

"Throughout the latency period the child learns to love other persons who assist it in its helplessness and gratify its wants; all this follows the model and is a continuation of the child's infantile relations to his wet nurse."

"The intercourse between the child and its foster parents is for the former an inexhaustible source of sexual excitation and gratification of erogenous zones, especially since the parents—or as a rule the mother—supplies the child with feelings which originate from her own sexual life; she pats it, kisses it, and rocks it, plainly taking it as a substitute for a full-valued sexual object."

At puberty a more or less definite separation from the sexual object of childhood normally takes place, largely through the operation of the incest barrier of the prevailing morality. "The observance of this barrier is above all a demand of cultural society which must guard against the absorption by the family of those interests which it needs for the production of higher social units. Society, therefore, uses every means to loosen those family ties in every individual, especially in the boy, which are authoritative in childhood only."

This change and the final finding of the proper sexual object is accomplished gradually. "It is a distinct echo of this phase of development that the first serious love of the young man is often for a mature woman and that of the girl for an older man equipped with authority."

Irregularities of sex development occur as a result partly of variations in innate tendency and partly of environmental influences and happenings. " Every step on this long road of development may become a point of fixation." The fore-pleasure of infantile sexuality may persist in one form or another and take the place of the normal adult sexual aim. Many *sexual perversions* " merely represent a lingering at a preparatory act of the sexual process."

When such infantile tendencies, persisting in adult life, become inhibited through repression, their energy is diverted either into *psychoneurotic symptoms*, or, by *sublimation*, into artistic, social, and intellectual activities.

As regards the sexual object, too, " Many persons are detained at every station in the course of development through which the individual must pass; and accordingly there are persons who never overcome the parental authority and never, or very imperfectly, withdraw their affection from their parents. They are mostly girls, who, to the delight of their parents, retain their full infantile love far beyond puberty, and it is instructive to find that in their married life these girls are incapable of fulfilling their duties to their husbands. They make cold wives and remain sexually anæsthetic. This shows that the apparently non-sexual love for the parents and the sexual love are nourished from the same source, i.e., that the first merely corresponds to an infantile fixation of the libido."

Psychopathology of Everyday Life.[1]—The mental mechanisms which underlie such commonplace occurrences as forgetting names or words and making slips of speech, writing or conduct have been investigated by the psycho-analytic method. It seems that " besides the simple forgetting of proper names there is another forgetting which is motivated by repression." " To avoid the awakening of pain through memory is one of the objects among the

[1] S. Freud. *Psychopathology of Everyday Life.* English edition by A. A. Brill. All quotations in this section are from this work, except those otherwise specified.

motives of these disturbances. In general one may distinguish two principal cases of name-forgetting: when the name itself touches something unpleasant, or when it is brought into connection with other associations which are influenced by such effects."

The following passage is quoted by Ernest Jones from *The Life of Charles Darwin*: "I had, during many years, followed a golden rule, namely, that whenever a published fact, a new observation or thought came across me, which was opposed to my general results, to make a memorandum of it without fail and at once; for I had found by experience that such facts and thoughts were far more apt to escape from the memory than favorable ones."

"There are some who are noted as generally forgetful, and we excuse their lapses in the same manner as we excuse those who are short-sighted when they do not greet us in the street. Such persons forget all small promises which they have made; they leave unexecuted all orders which they have received; they prove themselves unreliable in little things; and at the same time demand that we shall not take these slight offenses amiss—that is, they do not want us to attribute these failings to personal characteristics but to refer them to an organic peculiarity. I am not one of these people myself, and have had no opportunity to analyze the actions of such a person in order to discover from the selection of forgetting the motive underlying the same. I cannot forego, however, the conjecture *per analogiam*, that here the motive is an unusual large amount of unavowed disregard for others which exploits the constitutional factor for its purpose."

Brill has observed that "We are more apt to mislay letters containing bills than cheques." [1]

Freud cites the following report furnished by a young engineer: "Some time ago I worked with many others in the laboratory of the High School on a series of complicated experiments on the subject of elasticity. It was a work that

[1] A. A. Brill. *Psychanalysis: Its Theories and Practical Application.*

we undertook of our own volition, but it turned out that it took up more of our time than we expected. One day while going to the laboratory with F., he complained of losing so much time, especially on this day, when he had so many things to do at home. I could only agree with him, and he added half jokingly, alluding to an incident of the previous week: 'Let us hope that the machine will refuse to work, so that we can interrupt the experiment and go home earlier.' In arranging the work, it happened that F. was assigned to the regulation of the pressure valve, that is, it was his duty to carefully open the valve and let the fluid under pressure flow from the accumulator into the cylinder of the hydraulic press. The leader of the experiment stood at the manometer and called a loud 'Stop!' when the maximum pressure was reached. At this command F. grasped the valve and turned it with all his force—to the left (all valves, without any exception, are closed to the right). This caused a sudden full pressure in the accumulator of the press, and as there was no outlet, the connecting pipe burst. This was quite a trifling accident to the machine, but enough to force us to stop our work for the day, and go home. It is characteristic, moreover, that some time later, on discussing this occurrence, my friend F. could not recall the remark that I positively remember his having made."

"These as well as other similar experiences have caused me to think that the actions executed unintentionally must inevitably become the source of misunderstanding in human relations." "And this is, indeed, the punishment for the inner dishonesty to which people grant expression under the guise of 'forgetting,' of erroneous actions and accidental emotions, a feeling which they would do better to confess to themselves and others when they can no longer control it."

"Chance or symptomatic actions occurring in affairs of married life have often a most serious significance, and could lead those who do not concern themselves with the psychology of the unconscious to a belief in omens. It is not an

auspicious beginning if a young woman loses her wedding-ring on her wedding-tour, even if it were only mislaid and soon found. I know a woman, now divorced, who in the management of her business affairs frequently signed her maiden name many years before she actually resumed it."

"The common character of the mildest as well as the severest cases, to which the faulty and chance actions contribute, lies in the ability to refer the phenomena to unwelcome, repressed, psychic material, which, though pushed away from consciousness, is nevertheless not robbed of all capacity to express itself."

"One may possibly be disinclined to consider the class of errors which I have here explained as very numerous or particularly significant. But I leave it to your consideration whether there is no ground for extending the same points of view also to the more important errors of judgment, as evinced by people in life and science. Only for the most select and most balanced minds does it seem possible to guard the perceived picture of external reality against the distortion to which it is otherwise subjected in its transit through the psychic individuality of the one perceiving it."

Interpretation of Dreams.[1]—Psychoanalytic experience has shown that the mechanism of dreams is closely related to that of phobias, obsessions, delusions, and other psychoneurotic and psychotic symptoms. Therefore the study of dreams is important for psychiatry.

Dreams, regarded as a psychic process, present some well-known peculiarities. In dreams things are sometimes recalled which are inaccessible to memory in the waking state. One of the sources of such forgotten material, recalled in dreams, is in the events of childhood. In the selection of the reproduced material stress is laid in dreams not only on the most significant, but also on trivial and indifferent reminiscences. Among dream stimuli are to be mentioned sensory impressions (noises, chilling of exposed parts of the

[1] S. Freud. *The Interpretation of Dreams.* English translation by A. A. Brill. All quotations in this section are from this work.

body, subjective sensations), organic physical excitations (cardiac, pulmonary, digestive, uro-genital disturbances in disease and in health), and psychic exciting sources (events of waking hours). Dreams are apt to be quickly forgotten on waking. Sleeping dreams differ from day dreaming in that their character is hallucinatory and not ideational and in the suspension of the criticism by which they could be distinguished from reality.

Perhaps the ablest and most thorough investigation of the subject of dreams has been made by Freud, and he has de-developed a theory which endeavors to explain the above and other peculiarities. His large experience has led him to the following generalization: "When the work of interpretation has been completed the dream may be recognized as the fulfilment of a wish." By interpretation, in this connection, is meant the bringing to light, by psychoanalytic technique, of the *latent content* of dreams, the starting point in the process being their *manifest content.*

"There are dreams which are undisguised wish-fulfilments. Wherever a wish-fulfilment is unrecognizable and concealed, there must be present a feeling of repulsion towards this wish, and in consequence of this repulsion the wish is unable to gain expression except in a disfigured state." "We should then assume in each human being, as the primary cause of dream formation, two psychic forces (streams, systems), of which one constitutes the wish expressed by the dream, while the other acts as a *censor* upon this dream wish, and by means of this censoring forces a distortion of its expression." The above generalization has, accordingly, to be restated as follows: "The dream is the (disguised) fulfilment of a (suppressed, repressed) wish."

Freud is of the opinion that the *stimulus* for every dream is to be found among the experiences "upon which one has not yet slept," i.e., those of the preceding day; but the *material* may be selected from all times of life. As regards the latter he states, in fact, that "The deeper one goes in the analysis of dreams, the more often one is put on the track

of childish experiences which play the part of dream sources in the latent dream content." "As a rule, of course, a childhood scene is represented in the manifest dream content only by an allusion, and must be extricated from the dream by means of interpretation."

Trivial matters are never, in the opinion of Freud, the subject of dreams: "The dream never concerns itself with trifles; we do not allow ourselves to be disturbed in our sleep by matters of slight importance. Dreams which are apparently harmless turn out to be sinister if one takes pains to interpret them." "A *displacement*—let us say of the psychic accent—has taken place, until ideas that are at first weakly charged with intensity, by taking over the charge from ideas which have a stronger initial intensity, reach a degree of strength which enables them to force their way into consciousness. Such displacements do not at all surprise us when it is a question of the bestowal of affects or of the motor actions in general. The fact that the woman who has remained single transfers her affection to animals, that the bachelor becomes a passionate collector, that the soldier defends a scrap of colored cloth, his flag, with his life-blood, that in a love affair a momentary clasping of hands brings bliss, or that in *Othello* a lost handkerchief causes a burst of rage—all these are examples of psychic displacement which seem unquestionable to us."

"A connection with what has been recently experienced would form a part of the manifest content of every dream and a connection with what has been most remotely experienced, of its latent content." With reference to somatic sources of dream stimulation, Freud has been led to the opinion that "The essential nature of the dream is not changed by this addition of somatic material to the psychic sources of the dream; it remains the fulfilment of a wish without reference to the way in which its expression is determined by the actual material."

The biological purpose of dreams seems to be to prevent the interruption of sleep by disturbing sensations or thoughts

from whatever source they may come. "The dream is the guardian of sleep, not the disturber of it." "Either the mind does not concern itself at all with the causes of sensations, if it is able to do this in spite of their intensity and of their significance, which is well understood by it; or it employs the dream to deny these stimuli; or thirdly, if it is forced to recognize the stimulus, it seeks to find that interpretation of the stimulus which shall represent the actual sensation as a component part of a situation which is desired and which is compatible with sleep." "The wish to sleep, by which the conscious ego has been suspended and which along with the dream-censor contributes its share to the dream, must thus always be taken into account as a motive for the formation of dreams, and every successful dream is a fulfilment of this wish."

In some dreams, notably many typical ones, like that of appearing undressed in public, falling, death of near relatives, the dreamer experiences embarassment, fear, anxiety, or other painful emotion which would seemingly contradict the wish-fulfillment theory. It should be borne in mind, however, that "The wishes represented in the dream as fulfilled are not always actual wishes. They may also be dead, discarded, covered, and repressed wishes, which we must nevertheless credit with a sort of continuous existence on account of their reappearance in the dream." "The more one is occupied with the solution of dreams, the more willing one must become to acknowledge that the majority of the dreams of adults treat of sexual material and give expression to erotic wishes." "Let us recognize at once that this fact is not to be wondered at, but that it is in complete harmony with the fundamental assumptions of dream explanation. No other impulse has had to undergo so much suppression from the time of childhood as the sex impulse in its numerous components, from no other impulse have survived so many and such intense unconscious wishes, which now act in the sleeping state in such a manner as to produce dreams."

Freud is of the opinion that dreams of nakedness are based on recollections from earliest childhood and are an expression of repressed exhibitionism: " It may be observed in the case of children . . . that being undressed has a kind of intoxicating effect upon them, instead of making them ashamed. They laugh, jump about, and strike their bodies; the mother, or whoever is present, forbids them to do this, and says, ' Fie, that is shameful—you mustn't do that.' Children often show exhibitional cravings; it is hardly possible to go through a village in our part of the country without meeting a two- or three-year-old tot who lifts up his or her shirt before the traveller, perhaps in his honour." The disagreeable emotion accompanying these dreams is the manifestation of an intrapsychic conflict: " According to our unconscious purpose, exhibition is to be continued; according to the demands of the censor, it is to be stopped."

" Dreams of falling are most frequently characterized by fear. Their interpretation, when they occur in women, is subject to no difficulty because women always accept the symbolic sense of falling, which is a circumlocution for the indulgence of an erotic temptation."

Referring to the rather common dreams of the death of a near relative, Freud states: " The death wish of the child towards its brothers and sisters has been explained by the childish egotism, which causes the child to regard its brothers and sisters as competitors." " Dreams of the death of parents predominantly refer to that member of the parental couple which shares the sex of the dreamer, so that the man mostly dreams of the death of his father, the woman of the death of her mother."

" According to my experience, which is now large, parents play a leading part in the infantile psychology of all later neurotics, and falling in love with one member of the parental couple and hatred of the other help to make up that fateful sum of material furnished by the psychic impulses, which has been formed during the infantile period, and which is of such great importance for the symptoms appearing in the

later neurosis. But I do not think that psychoneurotics are here sharply distinguished from normal human beings, in that they are capable of creating something absolutely new and peculiar to themselves. It is far more probable, as is shown also by occasional observation upon normal children, that in their loving or hostile wishes towards their parents psychoneurotics only show in exaggerated form feelings which are present less distinctly and less intensely in the minds of most children. Antiquity has furnished us with legendary material to confirm this fact, and the deep and universal effectiveness of these legends can only be explained by the above-mentioned assumption in infantile psychology."

" I refer to the legend of King Œdipus and the drama of the same name by Sophocles. Œdipus, the son of Laius, king of Thebes, and of Jocasta, is exposed while a suckling, because an oracle has informed the father that his son, who is still unborn, will be his murdcrer. He is rescued, and grows up as the king's son at a foreign court, until, being uncertain about his origin, he also consults the oracle, and is advised to avoid his native place, for he is destined to become the murderer of his father and the husband of his mother. On the road leading away from his supposed home he meets King Laius and strikes him dead in a sudden quarrel. Then he comes to the gates of Thebes, where he solves the riddle of the Sphynx who is barring the way, and he is elected king by the Thebans in gratitude, and is presented with the hand of Jocasta. He reigns in peace and honour for a long time, and begets two sons and two daughters upon his unknown mother, until at last a plague breaks out which causes the Thebans to consult the oracle anew. Here Sophocles' tragedy begins. The messengers bring the advice that the plague will stop as soon as the murderer of Laius is driven from the country. But where is he hidden? 'Where are they to be found? How shall we trace the perpetrators of so old a crime where no conjecture leads to discovery?' The action of the play now consists merely in a revelation,

which is gradually completed and artfully delayed—resembling the work of psychoanalysis—of the fact that Œdipus himself is the murderer of Laius, and the son of the dead man and of Jocasta. Œdipus, profoundly shocked at the monstrosities which he has unknowingly committed, blinds himself and leaves his native place. The oracle has been fulfilled."

" Perhaps someone will now object that, although the inimical impulses of children towards their brothers and sisters (or parent) may well enough be admitted, how does the childish disposition arrive at such a height of wickedness as to wish death to a competitor or stronger playmate, as though all transgressions could be atoned for only by the death-punishment? Whoever talks in this manner forgets that the childish idea of ' being dead ' has little else but the words in common with our own. The child knows nothing of the horrors of decay, of shivering in the cold grave, of the terror of the infinite Nothing, which the grown up person, as all the myths concerning the Great Beyond testify, finds it so hard to bear in his conception. Fear of death is strange to the child; therefore it plays with the horrible word and threatens another child."

Symbolism in Dreams.—" When one has become familiar with the abundant use of symbolism for the representation of sexual material in dreams, one naturally raises the question whether there are not many of these symbols which appear once and for all with a firmly established significance like the signs in stenography; and one is tempted to compile a new dream-book according to the cipher method. In this connection it may be remembered that this symbolism does not belong peculiarly tc the dream, but rather tc unconscious thinking, particularly that of the masses, and it is to be found in greater perfection in the folk-lore, in the myths, legends, and manners of speech, in the proverbial sayings, and in the current witticisms of a nation than in its dreams."

" The dream takes advantage of this symbolism in order to give a disguised representation of its latent thoughts.

Among the symbols which are used in this manner there are of course many which regularly, or almost regularly, mean the same thing. Only it is necessary to keep in mind the plasticity of psychic material. Now and then a symbol in the dream content may have to be interpreted not symbolically, but according to its real meaning; at another time the dreamer, owing to a peculiar set of recollections, may create for himself the right to use anything whatever as a sexual symbol, though it is not ordinarily used in that way. Nor are the most frequently used sexual symbols unambiguous every time."

"After these limitations and reservations I may call attention to the following: Emperor and Empress (King and Queen) in most cases really represent the parents of the dreamer; the dreamer himself or herself is the prince or princess. All elongated objects, sticks, tree-trunks, and umbrellas (on account of the stretching-up which might be compared to an erection!) all elongated and sharp weapons, knives, daggers, and pikes, are intended to represent the male member. A frequent, not very intelligible, symbol for the same is a nail-file (on account of the rubbing and scraping?). Little cases, boxes, caskets, closets, and stoves correspond to the female part. The symbolism of lock and key has been very gracefully employed by Uhland in his song about the 'Grafen Eberstein,' to make a common smutty joke. The dream of walking through a row of rooms is a brothel or harem dream. Staircases, ladders, and flights of stairs, or climbing on these, either upwards or downwards, are symbolic representations of the sexual act. Smooth walls over which one is climbing, façades of houses upon which one is letting oneself down, frequently under great anxiety, correspond to the erect human body, and probably repeat in the dream reminiscences of the upward climbing of little children on their parents or foster parents. 'Smooth' walls are men. Often in a dream of anxiety one is holding on firmly to some projection from a house. Tables, set tables, and boards are women, perhaps on

account of the opposition which does away with the bodily contours. Since 'bed and board' (*mensa et thorus*) constitute marriage, the former are often put for the latter in the dream, and as far as practicable the sexual presentation complex is transposed to the eating complex. Of articles of dress the woman's hat may frequently be definitely interpreted as the male genital. In dreams of men one often finds the cravat as a symbol for the penis; this indeed is not only because cravats hang down long, and are characteristic of the man, but also because one can select them at pleasure, a freedom which is prohibited by nature in the original of the symbol. Persons who make use of this symbol in the dream are very extravagant with cravats, and possess regular collections of them. All complicated machines and apparatus in dream are very probably genitals, in the description of which dream symbolism shows itself to be as tireless as the activity of wit. Likewise many landscapes in dreams, especially with bridges or with wooded mountains, can be readily recognized as descriptions of the genitals. Finally where one finds incomprehensible neologisms one may think of combinations made up of components having a sexual significance. Children also in the dream often signify the genitals, as men and women are in the habit of fondly referring to their genital organ as their 'little one.' As a very recent symbol of the male genital may be mentioned the flying machine, utilization of which is justified by its relation to flying as well as occasionally by its form. To play with a little child or to beat a little one is often the dream's representation of onanism."

Dream Mechanisms.—In the translation of dream *thoughts* into dream *content* three principal mechanisms are at work: *condensation*, *displacement*, and *moulding for presentability.*

"The first thing which becomes clear to the investigator in the comparison of the dream content with the dream thoughts is that a tremendous work of condensation has taken place. The dream is reserved, paltry, and laconic when compared with the range and copiousness of the dream

thoughts." "Every element of the dream content turns out to be *over-determined*—that is, it enjoys a manifold representation in the dream thoughts."

"In the formation of dreams those elements which are emphasized with intense interest may be treated as though they were inferior, and other elements are put in their place which certainly were inferior in the dream thoughts." "There has taken place in the formation of the dream a *transference* and *displacement* of the psychic intensities of the individual elements." "The process which we assume here is nothing less than the essential part of dream activity; it merits the designation of dream displacement. *Dream displacement* and *dream condensation* are the two craftsmen to whom we may chiefly attribute the moulding of the dream." "We are already acquainted with dream disfigurement; we have traced it back to the censorship which one psychic instance in the psychic life exercises upon the other. Dream displacement is one of the chief means for achieving this disfigurement." "We may assume that dream displacement is brought about by the influence of this censor, of the endopsychic repulsion."

"A third factor, whose part in the transformation of the dream thoughts into the dream content is not to be considered trivial, is the regard for presentability (German: *Darstellbarkeit*) in the peculiar psychic material which the dream makes use of—that is fitness for representation, for the most part by means of visual images. Among the various subordinate ideas associated with the essential dream thoughts, that one will be preferred which permits of a visual representation, and the dream activity does not hesitate promptly to recast the inflexible thought into another verbal form, even if it is the more unusual one, as long as this form makes dramatization possible, and thus puts an end to the psychological distress caused by cramped thinking."

"It has been my experience—and to this I have found no exception—that every dream treats of one's own person. Dreams are absolutely egotistic. In cases where not my

ego, but only a strange person occurs in the dream content, I may safely assume that my ego is concealed behind that person by means of identification."

Freud's observations concerning the *affects in dreams* are of great interest: "The fact that in dreams the presentation content does not entail the affective influence which we should expect as necessary in waking thought has always caused astonishment." "I am in a horrible, dangerous, or disgusting situation in the dream, but I feel nothing of fear or aversion; on the other hand, I am sometimes terrified at harmless things and glad at childish ones. This enigma of the dream disappears more suddenly and more completely than perhaps any other of the dream problems, if we pass from the manifest to the latent content. We shall no longer be concerned to explain it, for it will no longer exist. Analysis teaches us that presentation contents have undergone displacements and substitutions, while affects have remained unchanged."

Two Kinds of Thinking: Realistic and Autistic.—No deep insight into mental mechanisms is possible without taking cognizance of the fact of two kinds of thinking: one variously designated *logical, directed,* or *realistic,* the other *dream, phantasy,* or *autistic* thinking. "The first, working for communication with speech elements, is troublesome and exhausting; the latter, on the contrary, goes on without trouble, working spontaneously, so to speak, with reminiscences. The first creates innovations, adaptations, imitates reality and seeks to act upon it. The latter, on the contrary, turns away from reality, sets free subjective wishes, and is, in regard to adaptation, wholly unproductive." [1]

"In general, a tendency to realistic, 'logical,' 'common-sense' thinking grows in us by reason of its service in meeting our situations favorably and wholesomely. Just as useful patterns of behavior tend to be perpetuated, and harmful

[1] C. G. Jung. *Psychology of the Unconscious.* English Translation by Beatrice M. Hinkle. New York, 1916.

ones to disappear by selection, so have the modes of thought that are more useful tended more and more to order our important actions. Almost the entire thinking of primitive humanity was governed by indiscriminate, simply associative modes of thought, not yet subjected to the selective test of 'working' or failure. Autistic thinking in relation to the sphere of voluntary conduct is therefore very prominent in them. Such thinking appears in the foreground of mental disease as we see it to-day. But in normal persons, autistic thinking is gradually being relegated to less essential functions, like dreaming, wit, and forms of mental recreation. In the mentally healthier persons, this relegation and selection is the more complete. Realistic and directive thinking has been more and more selected for survival." [1]

"The element of the dream thoughts which I have in mind, I am in the habit of designating as a 'phantasy'; perhaps I shall avoid misunderstanding if I immediately adduce the day dream of waking life as an analogy." "A more thorough examination into the character of these day phantasies shows with what good reason the same name has been given to these formations as to the products of our nocturnal thoughts—dreams." "Like dreams, they are fulfilments of wishes; like dreams, a good part of them are based upon the impressions of childish experiences; like dreams their creations enjoy a certain amount of indulgence from the censor." The sleeping dream, however, is distinguished from the day dream in that "the presentation content is not thought, but changed into perceptible images to which we give credence and which we believe we experience." [2]

"The boundary line between rational and autistic speculations cannot be laid down by human intellect. What is inconceivable to-day may to-morrow become fact; what is firmly believed to-day may to-morrow become false.

[1] F. L. Wells. *Mental Adjustments.* New York, 1917.

[2] S. Freud. *The Interpretation of Dreams.* English translation by A. A. Brill. New York, 1916.

Therefore a humanity without autistic thinking could not have been developed. But autistic thinking being once there, it will be used, whensoever convenient, whether useful or not. Now conceptions are pleasant or unpleasant just as well as outer experiences. One can therefore give pleasure to oneself by dwelling on pleasant ideas. But the animal organism is from phylogenetically ancient times adapted to seek pleasure and to avoid pain. In the outer world the pleasure- and pain-provoking events are such that this reaction upon them corresponds in general to our needs. But in pure imagination at once a new field of unlimited possibilities unfolds itself. Therein is the danger for man and at the same time his advantage over the brutes. The health of the individual and of nations demands a balanced proportion of autistic and realistic function. The realistic must control the autistic. But the autistic contains most of our ideals. Let us take care to keep them on the same level as our technical progress and not to misuse them to harass and to destroy our neighbors." [1]

Technique of Psychoanalysis.—Psychoanalysis may be undertaken either for the purpose of gaining insight into underlying mental mechanisms of normal or abnormal conduct, or for a therapeutic purpose. If for the latter, it is important to bear in mind that not all cases can be materially benefited by this method of treatment. Psychoanalysis should not be attempted with patients of low cultural status, or in cases of marked mental deficiency, psychoses of established chronicity, or those arising on an organic basis. Old age, grave character defects, and unwillingness to be cured are among other conditions constituting obstacles to successful psychoanalytic treatment. Psychoneuroses and mild or remittent psychoses, occurring in intelligent, educated, and sincere persons are most hopeful as regards results to be derived from psychoanalytic treatment.

Inasmuch as psychoanalysis is undertaken in cases in

[1] E. Bleuler. *Autistic Thinking.* Amer. Journ. of Insanity, Special Number, Vol. LXIX, 1913.

which symptoms are assumed to be actuated by complexes that are submerged in the region of the unconscious by reason of being charged with painful affect, the physician must be prepared to meet with more or less determined *resistance* to his probing. To overcome this resistance it is necessary, while becoming acquainted with the patient, in the course of history taking and physical examination, and before the work of psychoanalysis proper is begun, to inspire the patient with friendliness, respect, confidence, hopefulness, and, above all, a certain intimacy which might be likened to that of, say, parent and child.

Some such relationship between physician and patient has always been instinctively understood to be desirable even where it is merely a question of the patient submitting to a surgical procedure, a dietetic régime, or a course of medication. In cases requiring psychoanalysis it is an indispensable condition. In older psychotherapy it was known as *rapport*. Psychoanalysts speak of it as *transference* (of affection).

In the growth of such a relationship the patient's feeling toward the physician may become one of sexual love. Under such circumstances the physician " must neither drive away the transference nor must he return it. He must firmly grasp the phenomenon as a temporary manifestation belonging only to the period of treatment, which must be led back to its unconscious sources, an instrument which will thus serve to bring into consciousness the most hidden part of the patient's love life in order to obtain mastery over it. There must be enough permission granted to the love to allow the patient to feel herself sufficiently secure to produce all the stipulations, phantasies and characteristics of her erotic desires, which lead the way into their infantile sources." " The situation as far as the physician is concerned is simply an inevitable part of the treatment for which he must assume the responsibility as for any other professional confidence and trust, a responsibility that is only increased by the ready willingness of the patient. Technical as well as

ethical motives determine his responsibility and strengthen his appreciation of the therapeutic value of this situation. The love is to be freed from its infantile fixations, not in order to be expended in the course of the treatment but to be preserved for the demands of real life for which the treatment is preparing the patient." [1]

In psychoanalytic work considerable use has been made of word-association tests.[2] The technique of such a test is described in Appendix VI, of this MANUAL. In the main, however, the work of psychoanalysis—whether in the study of psychoneurotic symptoms or of dreams—consists in a procedure described by Freud as follows:

"A certain psychic preparation of the patient is necessary. The double effort is made with him, to stimulate his attention for his psychic perceptions and to eliminate the critique with which he is ordinarily in the habit of viewing the thoughts which come to the surface in him. For the purpose of self-observation with concentrated attention, it is advantageous that the patient occupy a restful position and close his eyes; he must be explicitly commanded to resign the critique of the thought formations which he perceives. He must be told further that the success of the psychoanalysis depends upon his noticing and telling everything that passes through his mind, and that he must not allow himself to suppress one idea because it seems to him unimportant or irrelevant to the subject, or another because it seems nonsensical. He must maintain impartiality towards his ideas; for it would be owing to just this critique if he were unsuccessful in finding the desired solution of the dream, the obsession, or the like."

"I have noticed in the course of my psychoanalytic work

[1] S. Freud. *Bemerkungen u. d. Uebertragungsliebe.* Int. Zeit. f. Aerzt. Psa., Vol. III, No. 1, 1915. Quoted by S. E. Jelliffe. *The Technique of Psychoanalysis.* New York, 1918.

[2] C. G. Jung. *Diagnostische Assoziationsstudien.* Vol. I, 1906, Vol. II, 1910.—E. Jones. *The Practical Value of the Word-Association Method in the Treatment of Psychoneuroses.* Rev. of Neurol. and Psychiatry, Nov., 1910.

that the state of mind of a man in contemplation is entirely different from that of a man who is observing his psychic processes. In contemplation there is a greater play of psychic action than in the most attentive self-observation; this is also shown by the tense attitude and wrinkled brow of contemplation, in contrast with the restful features of self-observation. In both cases, there must be concentration of attention, but, besides this, in contemplation one exercises a critique, in consequence of which he rejects some of the ideas which he has perceived, and cuts short others, so that he does not follow the trains of thought which they would open; toward still other thoughts he may act in such a manner that they do not become conscious at all—that is to say, they are suppressed before they are perceived. In self-observation, on the other hand, one has only the task of suppressing the critique; if he succeeds in this, an unlimited number of ideas, which otherwise would have been impossible for him to grasp, come to his consciousness. With the aid of this material, newly secured for the purpose of self-observation, the interpretation of pathological ideas, as well as of dream images, can be accomplished."

"The suspension thus required of the critique for these apparently 'freely rising' ideas, which is here demanded and which is usually exercised on them, is not easy for some persons. The 'undesired ideas' are in the habit of starting the most violent resistance, which seeks to prevent them from coming to the surface."

"Most of my patients accomplish it after the first instructions; I myself can do it very perfectly, if I assist the operation by writing down my notions. The amount, in terms of psychic energy, by which the critical activity is in this manner reduced, and by which the intensity of the self-observation may be increased, varies widely according to the subject matter upon which the attention is to be fixed."

"The first step in the application of this procedure now teaches us that not the dream as a whole, but only the parts

of its contents separately, may be made the object of our attention. If I ask a patient who is as yet unpracticed: 'What occurs to you in connection with this dream?' as a rule he is unable to fix upon anything in his psychic field of vision. I must present the dream to him piece by piece, then for every fragment he gives me a series of notions, which may be designated as the 'background thoughts' of this part of the dream."

"Comments on the dream and seemingly harmless observations about it often serve in the most subtle manner to conceal—although they usually betray—a part of what is dreamed. Thus, for example, when the dreamer says: *Here the dream is vague,* and the analysis gives an infantile reminiscence of listening to a person cleaning himself after defecation. Another example deserves to be recorded in detail. A young man has a very distinct dream which recalls to him phantasies from his infancy which have remained conscious to him: he was in a summer hotel one evening, he mistook the number of his room, and entered a room in which an elderly lady and her two daughters were undressing to go to bed. He continues: '*Then there are some gaps in the dream; then something is missing;* and at the end there was a man in the room who wished to throw me out with whom I had to wrestle.' He endeavored in vain to recall the content and purpose of the boyish fancy to which the dream apparently alludes. But we finally become aware that the required content had already been given in his utterances concerning the indistinct part of the dream. The 'gaps' were the openings in the genitals of the women who were retiring: 'Here something is missing' describes the chief character of the female genitals. In those early years he burned with curiosity to see a female genital, and was still inclined to adhere to the infantile sexual theory which attributes a male genital to a woman.'

"If the report of a dream appears to me at first difficult to understand, I request the dreamer to repeat it. This he rarely does in the same words. The passages wherein the

expression is changed have become known to me as the weak points of the dream's disguise." "The analysis may start from these points."

"It often happens that in the midst of interpretation work an omitted fragment of the dream suddenly comes to the surface. This part of the dream snatched from forgetfulness is always the most important part. It lies on the shortest road toward the solution of the dream, and for that very reason it was most objectionable to the resistance."

"In general it is doubtful in the interpretation of every element of the dream whether it—(*a*) is to be regarded as having a negative or a positive sense (relation of opposition); (*b*) is to be interpreted historically (as a reminiscence); (*c*) is symbolic; or whether (*d*) its valuation is to be based upon the sound of its verbal expression. In spite of this manifold signification, it may be said that the representation of the dream activity does not impose upon the translator any greater difficulties than the ancient writers of hieroglyphics imposed upon their readers."

"The interpretation of a dream cannot always be accomplished in one session; you often feel after following up a concatenation of thoughts, that your working capacity is exhausted; the dream will not tell you anything more on that day; it is then best to break off, and return to the work the following day. Another portion of the dream content then solicits your attention, and you thus find an opening to a new stratum of the dream thoughts. We may call this the 'fractionary' interpretation of dreams."

"The question whether every dream can be interpreted may be answered in the negative. One must not forget that in the work of interpretation one must cope with the psychic forces which are responsible for the distortion of the dream. Whether one can become master of the inner resistances through his intellectual interest, his capacity for self-control, his psychological knowledge, and his practice in dream interpretation becomes a question of the prepon-

derance of forces. It is always possible to make some progress." [1]

Cures through psychoanalysis are effected by bringing to light unconscious complexes underlying psychoneurotic symptoms and thus achieving psychic "*catharsis*." The patient is, of course, not relieved of the external situation which had provoked his symptoms as a diseased form of adjustment, but is helped to a normal, i.e., a more purposeful and more social form of adjustment.

"When I promised my patients help and relief through the cathartic method, I was often obliged to hear the following objections: 'You say, yourself, that my suffering has probably to do with my own relation and destinies. You cannot change any of that. In what manner, then, can you help me?' To this I could always answer: 'I do not doubt at all that it would be easier for destiny than for me to remove your sufferings, but you will be convinced that much will be gained if we succeed in transforming your hysterical misery into everyday unhappiness, against which you will be better able to defend yourself with a restored nervous system.'" [2]

Psychoanalysis in relation to psychoneuroses and psychoses cannot be fully treated in the limited space that is available for it in this MANUAL. For further study, therefore, the student must be referred to special works.[3]

[1] S. Freud. *The Interpretation of Dreams.* English translation by A. A. Brill. New York, 1916.

[2] S. Freud. *Selected Papers on Hysteria.* English translation by A. A. Brill. New York, 1909.

[3] S. Freud. *Delusion and Dream.*—E. Hitschmann. *Freud's Theories of the Neuroses.* English translation by C. R. Payne.—H. W. Frink. *Neurotic Fears and Obsessions.*—C. G. Jung. *The Psychology of Dementia Præcox.* English translation by F. Peterson and A. A. Brill, New York, 1909.—A. A. Brill. *A Case of Schizophrenia.* Amer. Journ. of Insanity, July, 1909.—E. Jones. *Psycho-Analytic Notes on a Case of Hypomania.* Amer. Journ. of Insanity, Oct., 1909.

CHAPTER X

THE PRACTICE OF PSYCHIATRY (*Continued*)

APPLICATIONS OF SOCIOLOGY IN PSYCHIATRY

The origin of social work is found, not in the science of sociology, but in the primitive impulse to relieve distress, which, gradually growing into organized form under the auspices of the church, was systematized by the State, and later by voluntary associations. At the present time we have an enormous net-work of agencies, religious, governmental, and private, existing for the prevention and relief of social disorder. By degrees social work has been growing toward a realization of the importance of seeking out fundamental causes of distress and of applying the principles of sociology to social problems. While the sociologist has been becoming more concrete, the social worker has been showing more scientific potentiality. Now we have sociology and social work, independent in their origin, coming into closer and closer association leading to a fusion in which social work appears as *applied sociology*.

At the same time that social work has been approaching in its concepts the science of sociology, it has been coming in practice into closer relation to psychiatry. In the beginning, the concern of social work was chiefly *economic* relief, but eventually it came to be also *physical* health. Sickness was found to accompany poverty in 75% of needy cases. Within a few years, the *mental* factors of social maladjustment have been coming to the front as one of the main interests in social work.

In a text-book on mental disease,[1] written by a state hospital superintendent over twenty years ago, we find a discussion of *social readjustment* as an important part of treatment. Quoting from this treatise, "Insanity, practically, is loss of the power of conformity to the social medium in which the patient lives. This power is regained in convalescence gradually, and it is a part of psychotherapy to furnish a normal personal environment to which the patient is to practice adjustment." And again, "The physician who has conducted a case of mental disorder through all the vicissitudes of an acute attack to perfect recovery has a final duty to perform. There are to be laid down definite rules of life, points in physical and mental hygiene, suggestions of the best way to meet social and business difficulties, and advice as to domestic relations." It was some fifteen years later that systematic provision began to be made for seeing that these "rules of life" laid down by the physician were actually followed by the patient.

The first attempt in this country to employ social work in the care of patients with nervous and mental disorders seems to have been in the Neurological Clinic of the Massachusetts General Hospital in Boston in 1905, at which time Dr. James J. Putnam, who was in charge of the clinic, engaged a social worker and trained her for this work. Since then the movement has grown rapidly. Social service departments have been organized in psychiatric clinics and hospitals in New York, Massachusetts, Illinois, Michigan and elsewhere. In the World War the American army established well-organized psychiatric social service departments in military hospitals.

Interrelation of Social and Mental Disorders.—The necessity for close coöperation between psychiatrist and sociologist is evident when it is considered that mental disorder and social disorder are but two aspects of the same condition.

[1] Kellogg, Theodore H., M.D. *A Text-Book of Mental Diseases.* New York, 1897, pp. 501 and 515.

The interrelation of mental and social conditions appears with particular distinctness in two recently conducted county surveys of mental disorders.[1] The object of the Survey in Nassau County, New York, is stated as follows:

"The principal question raised is not, What is the percentage of 'insane' or 'feeble-minded' or 'mentally defective' persons in the population? But rather, What instances of social maladjustment sufficiently marked to have become the concern of public authorities, are, upon investigation, to be attributed mainly or in large measure to mental disorders? Thus the main object of the Survey was to study the nature of the relationship between social maladjustments and mental disorders."

Out of 1592 abnormal cases found in the county, only 163 or 10.2% showed no social maladjustment, all the others having shown social maladjustment of one or more of the following specified types: (*a*) Retardation in school, (*b*) Truancy, unruliness, (*c*) Sex immorality, (*d*) Criminal tendency, (*e*) Vagrancy, (*f*) Dependency, (*g*) Inebriety, (*h*) Drug habits, (*i*) Domestic maladjustment, (*j*) Medical cases.

In this connection, the position taken by the President of The National Committee for Mental Hygiene,[2] may be quoted as a criterion: "If sociology is the science that deals with social forces, social structures and institutions, social functions, and social progress (genetic and telic), the mere statement of the fact is surely sufficient evidence of the importance of this science to the student and practitioner of mental hygiene."

[1] Aaron J. Rosanoff, M.D. *Report of a Survey of Mental Disorders in Nassau County, New York.* National Committee for Mental Hygiene, 1916.—Herman M. Adler, M.D. *Cook County and the Mentally Handicapped: A Study of the Provisions for Dealing with Mental Problems in Cook County, Illinois.* Report of Survey, 1916–1917. National Committee for Mental Hygiene, 1918.

[2] Lewellys F. Barker. *The First Ten Years of the National Committee for Mental Hygiene, with Some Comments on its Future.* Mental Hygiene. Oct., 1918.

The Psychiatric Social Worker.—By reason of general recognition of the above a demand has arisen for psychiatric social work and special training is being provided.[1]

Not everybody is equipped for psychiatric social work. The psychiatric social worker must be a person with certain *natural qualifications.* She must, of course, be intelligent, well-balanced, sympathetic, and adaptable, with the ability to meet all sorts of persons and a manner that wins confidence. She must have a strong interest in individuals and a liking to follow them into the scenes of their daily lives. She needs considerable patience. Ability to think clearly and to make close observations is indispensable. A high degree of disinterestedness is essential; for the social worker must be ready at all times to give service to the patients without discrimination.

Training for psychiatric social work assumes a preliminary foundation in biology, psychology, sociology, economics, and political science. In addition to these fundamental branches, there should be courses in social legislation, social statistics, labor problems, organization of social work, and training, with practice work in the technique of social case work. There should also be elementary instruction in the essentials of medicine. Finally, there should be a course in social psychiatry, which would include the principles of mental hygiene, the main groups and simpler indicators of mental disorders with a general view of their governmental, social, family, and personal significances.

Opportunities for *practice work* have been afforded to students in various mental clinics and through interneships and externeships in certain hospitals for mental disease, including Manhattan and Brooklyn State Hospitals,

[1] George M. Kline. *Social Service in the State Hospital.* Proceedings, American Medico-Psychological Association, 1916.—C. Macfie Campbell, M.D. *The Mental Health af the Community and the Work of the Psychiatric Dispensary.* Mental Hygiene, Oct., 1917.—E. E. Southard. *Mental Hygiene and Social Work: Notes on a Course in Social Psychiatry for Social Workers.* Mental Hygiene, July, 1918.

in New York, and Boston State and Psychopathic Hospitals, in Massachusetts.

The first systematic course of this kind to be given was the war emergency course conducted by Smith College and the Boston Psychopathic Hospital (1918–1919).[1] Out of this course grew the Smith College Training School for Social Work, in which training in psychiatric social work is offered. Similar courses are given at the New York School of Social Work, New York, and the Pennsylvania School of Social Service, Philadelphia.

The psychiatric social worker is to be found not only in hospitals, but wherever psychiatrists are engaged in the study and treatment of mental disorders. In courts, reformatories, schools, social agencies the social worker with special knowledge of neuro-psychiatric cases is needed. There are signs that it may not be long before large industries maintaining a medical service for employees shall have psychiatrists on their medical staffs. It is probable that industrial hygiene will soon be extended to include mental hygiene. In that case a new demand for psychiatric social workers will be created.

Functions of a Sociological Department.—The sociological or social service department of a hospital for mental diseases has functions related to (*a*) diagnosis, (*b*) treatment, (*c*) research, and (*d*) education. Every patient admitted requires consideration of his social condition as well as of his mental condition. In many cases a medical diagnosis can not be made without knowledge of the patient's social history. In some cases prolonged observation of the patient in the community is essential to a diagnosis.

[1] *The Training School of Psychiatric Social Work at Smith College:* I. *Educational Significance of the Course*, by W. A. Neilson. II. *A Lay Reaction to Psychiatry*, by E. E. Southard. III. *The Course in Social Psychiatry*, by Edith R. Spaulding. IV. *A Scientific Basis for Training Social Workers*, by F. Stuart Chapin. V. *An Emergency Course in a New Branch of Social Work*, by Mary C. Jarrett. Mental Hygiene, Oct., 1918.

In order to obtain a full *history* it is usually necessary to *go out into the community* to make inquiries. Medical work is facilitated, and complete histories are insured, when this function is delegated to a worker trained in social investigation.

The history secured by the social worker from informants in the community to aid the physician in his diagnosis will contain essentially the same information that he might obtain himself if these informants should come to the hospital. The discussion of history taking in Chapter V will therefore guide the social worker in this connection.

In addition to the information required for medical diagnosis, certain sociological data are required by the social worker in order to understand the patients' social condition and to provide the best possible social care. To begin with, names and addresses of relatives, employers, neighbors, teachers, clergymen, friends must be noted exactly, so that these persons may be visited as sources of information. These addresses are also necessary because the social worker must discover what beneficial resources exist in the patient's environment and who among his relatives and acquaintances would be helpful in supplying the assistance that he needs for social adjustment. The character of his home and the neighborhood in which he lives must be gone into carefully both through inquiry and direct observation, in order to effect improvement in his surroundings if unsuitable conditions are found. It is important to have fairly complete knowledge of all members of the family group and other relatives who may be closely associated with the patient. The attitude of the family toward the patient is a matter of special concern. The ratio between income and expenditures of the patient, or of the family group to which he belongs, and the relation between income and standard of living are matters of great practical importance in social care.

History from the patient through *direct examination* by the social worker is also essential, as data of sociological

significance are required, which the physician either does not obtain at all or obtains without sufficient detail for the purpose of social work. The social worker will of course avoid duplication of work already covered by the medical examination. Among points of special concern to the social worker are: What are the patient's own plans for his future? Has he satisfactory living conditions in view? Has he a prospect of suitable employment? What financial resource has the patient? If employed, the question arises whether he is receiving suitable wages or might better his condition. The matter of financial assistance from the proper social agency must be taken up in needy cases. The patient's attitude toward his family is an important consideration in social treatment. It is desirable to know which members of his family have most influence with him. The character of the patient's friends and companions is to be learned partly from him and partly by inquiry from other sources. His attitude toward them and the extent to which they influence him should be inquired into. The tastes and preferences of the patient in regard to employment, recreation, and occupation in leisure time must be learned to some extent by direct examination. Clues for further inquiry to secure history must be obtained with full names and addresses. The general social and educational background of informants who are to be seen or written to is of great importance. An inquiry is likely to be more fruitful if the investigator knows something of the character of the person approached. This is particularly true where the inquiry must be made by letter, and is of even more importance perhaps where the inquiry is made over the telephone. Finally in talking with the patient, the social worker establishes an intimacy which she must develop if she is to deal successfully with the intimate problems of his social life.

Another aid to diagnosis in connection with out-patient clinics is *prolonged observation* through the social service of doubtful cases in the community. Reports of the patient's

behavior at home brought in by the social worker and notes on the way in which the patient responds to the efforts of the social worker to improve his social condition are often the means of reaching a correct diagnosis in a dubious case.

In *treatment*, the work of the social service is almost entirely with out-patients (both those who have been in hospital and those who have not), although some assistance is given in the treatment of patients in the hospital in such ways as setting in order difficulties at home, furnishing assurance that suitable conditions for discharge will be ready, and relieving the patient of other real anxieties. The responsibility to out-patients is two-fold: to secure to the patient continued medical treatment by following him up if he fails to come back to see the physicians as directed; and to see that he is socially adjusted in respect to home, friends, recreation, employment.

This second duty is the special function of *social case work*—to organize all factors existing within the individual and his environment to effect the best possible adaptation of that individual to society. In this process the welfare of the family group must also receive attention since it closely affects the welfare of the patient. The treatment of some patients, as Dr. Adolf Meyer has said, is treatment of the environment. Not infrequently the physician finds the difficulty to be entirely social and leaves the case in the hands of the social worker. In most cases medical treatment needs to be supplemented and reinforced by social care.

The recent development of *out-patient clinics* connected with state hospitals has created an important demand for social work. In several states each state hospital now conducts one or more clinics held either at the hospital or in a neighboring center of population.[1] The services of social workers are indispensable in these clinics.

An important service of the social worker in a state hos-

[1] New York State Hospital Commission. *Thirtieth Annual Report*, 1917–1918.

pital is in connection with the *after-care* of paroled patients. In New York "the average daily number of patients on parole from the 13 civil state hospitals during the year (1917) was 1504 compared with 1346 in 1916, 1280 in 1915, 1141 in 1914, and 978 in 1913." "The employment of field workers by the state hospitals and the establishment of additional clinics by the various institutions undoubtedly is responsible in a considerable measure for the increase in the number of patients on parole."[1] The reports point out the financial benefits of the parole system in saving maintenance and making room for new patients, thereby preventing overcrowding, as well as the more important advantage that the recovery of patients is often hastened, "when they can return to their own homes and familiar surroundings to complete the period of convalescence and at the same time continue under the watchful eye of the hospital. The hospital keeps in touch with these patients through its social workers who visit the homes before patients are paroled and who make periodical visits afterwards to see that conditions are satisfactory and that the patient is living in a manner calculated to prevent a recurrence of the disease, or, if a patient is not recovering satisfactorily, to see that he or she is returned to the hospital for proper treatment."

In *research*, social investigation is required in many studies of mental disease that call for previous history and continued observation of cases in the community. Experimental medical work in neuro-syphilis is largely dependent upon social assistance in keeping patients faithful to treatment and in inducing other members of the family to be examined and, if necessary, treated. Certain psychiatric problems can not be studied successfully without social work, such as the care of the feeble-minded at home, the training of delinquents, the adjustment of the psychopathic employee. In studies of heredity, social investigation is

[1] New York State Hospital Commission. *Twenty-ninth Annual Report*, 1916–1917.

essential. At the Eugenics Record Office, Cold Spring Harbor N. Y., a special course is given annually to train field workers for this purpose.

In *public education*, social workers have an unusual opportunity to spread the facts and principles of mental hygiene through their varied and numerous contacts in the community. Interest that began in a social inquiry about a particular case, may lead a teacher, clergyman, or employer to better knowledge of the subject of mental disease and mental hygiene. The training of students in psychiatric social work is an important educational responsibility.

Organization of a Sociological Department.—The organization of a sociological department in a hospital conducting an out-patient clinic must make provision primarily for social work contributing to diagnosis and treatment. The routine duties may be divided into (*a*) securing histories, (*b*) follow-up work, (*c*) social case work. These duties may be performed by different workers or united in any combination in one worker; but it is important that the three forms of service should be distinguished, in order that each receive due attention.

A social worker in attendance at the out-patient clinic takes a history from the patient as a basis for the medical examination, and at the same time inquires into his social condition to discover environmental difficulties calling for social treatment. The same worker will see that patients and friends accompanying them understand the physician's directions and are disposed to follow them. For history taking in the hospital, a special worker, who by practice becomes expert, is of great assistance to the medical staff.

By follow-up work is meant keeping informed by a card system of the failure of patients to keep their appointments and inducing them, by letter, telephone, or visit, to report. This might seem to be merely clerical work, but it will be found to require fine judgment and the interest and point of view of the social worker, the results obtained being in

proportion to the presence of these factors.[1] By this service also a patient dismissed by the physicians for six months or a year may be automatically brought back at the end of that time or reported upon by the social worker, if unable or unwilling to make a visit. The follow-up work for syphilitic patients is especially important. Another form of follow-up work is a routine method of seeking the relatives of all patients with a positive Wassermann reaction and bringing them to the clinic for examination.[2]

As nearly every case of mental disorder presents some problem of social maladjustment, a routine social examination of every admission should be made. Where the social staff is insufficient, which is almost invariably the case, the determination of the need of social care is necessarily left to the physicians, who refer cases to the social service. But the physician is not accustomed to look for social disorder nor familiar enough with social practice to know the possibilities of social care; so that he is likely to refer only cases of social disorder that are conspicuously acute or urgent.

The amount of time required for social case work is proportionately greater than the time required by medical work, for the patients under social care are widely scattered in the community and may need more or less close attention for months or years. As no hospital has yet a staff of social workers even approximately adequate for the work, there is a method in use of classifying social cases as either "intensive" or "slight service" cases according to the degree of responsibility assumed by the social service. "Slight service" cases are those in which assistance is given without inquiry beyond the apparent facts. In an intensive case the social service attempts to assume responsibility for making a full inquiry into the social condition of the patient and his

[1] E. E. Southard. *Report of the Director of the Psychopathic Department of the Boston State Hospital*, 1917.

[2] E. E. Southard. *Report of the Director of the Psychopathic Department of the Boston State Hospital*, 1918.

family, and endeavors to secure the largest measure of social well-being possible for both patient and family.

It has been estimated that 75% of all admissions will call for some form of social attention, which 25% may receive from social agencies in the community, so that 50% should receive social care from the social service of the hospital. As a social worker can not care for more than 100 to 150 cases a year adequately, a worker is needed for every 200 to 300 admissions.

CHAPTER XI

THE PRACTICE OF PSYCHIATRY (*Continued*)

PROGNOSIS—PREVALENCE OF MENTAL DISORDERS: ARE THEY ON THE INCREASE?

Prognosis.—In the early part of the nineteenth century, when the care of the insane had passed from the hands of the clergy, penal authorities, and poor-law officials to those of physicians, the hope was widely entertained that the medical treatment which thus became available for the insane would result in high percentages of cures. Thus, in one of the most important documents in the history of psychiatry in this country, a report under date of March 29, 1834, made to the New York state legislature by a special committee, we read: "It is now satisfactorily established that diseases of the mind yield even more readily to medical treatment than those of the body, and that in at least nine-tenths of the cases of insanity the patient may be restored to the full enjoyment of his mental faculties by the early application of judicious medical treatment." To-day not the most sanguine in the psychiatric branch of the medical profession would make such an assertion. The prognosis of psychotic disease is more correctly indicated by the following analysis of the recovery statistics of the Kings Park State Hospital, at Kings Park, New York, for the year ending September 30, 1915.

Two hundred and fourteen cases were discharged during the year as "recovered," making the recovery rate, based on direct admissions, 20.78%. Many of these reported recoveries, however, can be regarded as such only from a non-

medical point of view; for of these cases 31 were suffering at the time of their discharge from epilepsy, imbecility, constitutional inferiority, or paralysis agitans, having recovered merely from their "insanity," i.e., from acute psychotic manifestations which had led to their commitment; 49 had had one or more previous admissions to institutions and were evidently recurrent cases without likelihood of continued mental health in the future; 13 had recovered from alcoholic psychoses but probably not from the habit of intemperance; and 24 had been classed as constitutionally of inferior or defective make-up and had recovered not, of course, from their inferiority or defectiveness but, like the first mentioned group, merely from acute psychotic manifestations which had led to their commitment.

This leaves but 97 cases which can be said to have recovered in the sense of having shown at the time of their discharge a real freedom from demonstrated psychic abnormality. But if the universal past experience is a trustworthy guide, then it is unfortunately but too sure that a certain proportion even of this remnant will prove sooner or later to be of a recurrent nature; so that it is extremely doubtful if complete and permanent recoveries have occurred in more than 5% of all cases admitted.

It should be added here that the experience of the Kings Park State Hospital is, in this respect, by no means unique; on the contrary, it is but the general experience of psychiatric practice all over the world, as may be judged from the following passage quoted from Kraepelin:[1] "Only a comparatively small percentage of cases are permanently and completely cured in the strictest sense of the word." This statement, we believe, voices the concensus of competent psychiatric opinion.

It would seem from this that radical dealing with the problems of mental disease must be by way of prevention and not treatment.

[1] Kraepelin. *Lectures on Clinical Psychiatry.* Second edition in English, New York, 1906. P. 2.

Prevalence of Mental Disorders: Are They on the Increase?[1]—During the past several decades the number of insane in institutions has been increasing at a faster rate than the general population. Thus, according to the United States census statistics there were, in 1880, 81.6 patients in institutions for the insane per hundred thousand of the general population; in 1910 the number had risen to 204.2. To what extent, if any, does this fact indicate an actual increase in the prevalence of mental disorders in the American population?

There can be no doubt that, at least to some extent, the increase of patients in institutions is due merely to the general improvement in the kind and adequacy of facilities for their care; and if the statistics of various states for any one year are compared with one another, marked differences are found, corresponding to stages of progress in social organization, and altogether analogous to those shown by the entire country in years separated by decades.

Thus, for instance, in 1910 there were in the state of Oklahoma 67 patients in institutions per hundred thousand of the general population, while in the state of Massachusetts there were 344.6; and between these extremes all degrees of transition were presented by the statistics of other states.

It is obvious, therefore, that the number of patients in institutions, either in the entire country at different times or in different parts of it at any one time, cannot be taken as a correct measure of the prevalence of mental disorders among the people.

For this reason, attempts have been repeatedly made to enumerate the total number of insane persons both in and out of institutions in the various states.[2] The resulting data were, however, so manifestly untrustworthy that eventually it became apparent that the difficulties inherent in such an undertaking were greater than, for the present, we can

[1] A. J. Rosanoff. *Is Insanity on the Increase?* Journ. Amer. Med. Ass'n, July 24, 1915.

[2] U. S. Census from 1850 to 1890.

cope with successfully, and such attempts have, accordingly, been given up.

Of these difficulties the greatest and, perhaps, the sole insurmountable one is that of formulating such a definition of insanity as to enable enumerators readily and uniformly to distinguish between sane and insane persons, under all conditions.

Furthermore, whoever is familiar with psychiatric clinical material knows that, owing to the nature of things, even if it were possible to formulate a definition and thereby draw a line sharply distinguishing, for practical purposes, sanity from insanity, the line could be thus drawn only in relation to some more or less arbitrary standard of normality.

The need of standards of normality is felt not only in connection with attempts of enumeration of the insane in communities, but also in daily practice in connection with every case of alleged insanity in which commitment to an institution is sought; and in this respect the practice of the various states, varying as it does within wide limits, indicates the application of a whole series of fairly distinct, though not readily definable, standards.

Thus, referring again to the instances presented by Oklahoma and Massachusetts, significance attaches mainly to the consideration that there are undoubtedly many persons residing in the former state who are at large and whom, moreover, their fellow citizens do not consider proper subjects for an insane hospital, but who would be promptly committed if they took up their residence in the latter state. In the last analysis, it is a difference in tacitly accepted standards of normality that accounts largely for the fact that in Oklahoma, as already stated, there were but 67 patients in institutions per hundred thousand of the general population, while in Massachusetts there were no less than 344.6; and similar differences in standards no doubt account for the analogous contrasts presented by statistics of the insane in institutions in the entire country at different times.

Persons are placed in institutions when, by reason of some mental defect or disturbance, their adaptation to their environment fails. The environment of a highly organized community with high standards of living is, of course, more exacting than that of a community characterized by a more primitive organization and lower standards.

Whatever may be one's theoretical conception of insanity, the line of division between it and the normal condition, as it is indicated by the practice of communities, is a shifting one, moving from the abnormal toward the normal extreme with the progress of civilization and the concomitant elevation of social standards.

These considerations are of importance, as they point a way to an indirect method of investigating the question which is before us, Are mental disorders on the increase? For, although it would be, of course, impossible to apply a newly selected standard to conditions in the remote past concerning which we have no information other than that recorded by contemporary observers, it is at least within the bounds of possibility to apply such a standard in studying conditions in various parts of the country as they exist in our own time.

The states east of the Mississippi River may be divided into a Northern group, comprising Connecticut, Illinois, Indiana, Maine, Massachusetts, Michigan, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, and Wisconsin; and a Southern group, comprising Alabama, Delaware, Florida, Georgia, Kentucky, Maryland, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia.

Facilities for the care of the insane have at all times been relatively more ample in the Northern group of states, and, accordingly, the number of patients in institutions in relation to the general population has always been greater, as shown in the accompanying table.

The difference between these two groups of states is certainly very striking. From what has been said it would

follow that the question, To what extent does this difference correspond with a real difference in incidence of insanity? is lacking in definiteness. It may be better expressed as follows: If the populations of the two groups of states, or representative portions of them, were exposed to the same environmental conditions, would there still be a difference between them as to the proportion of patients contributed to insane hospitals; and, if so, which group would contribute the higher proportion and how great would be the difference?

TABLE 6.

NUMBER OF INSANE IN INSTITUTIONS PER HUNDRED THOUSAND OF THE GENERAL POPULATION IN CERTAIN YEARS IN TWO GROUPS OF STATES EAST OF THE MISSISSIPPI RIVER.

	Census Years			
	1880	1890	1904	1910
Northern group	104.9	145.1	230.7	256.6
Southern group	48.8	79.7	117.5	132.3

One advantage in thus expressing the question is that it affords a suggestion of a method for seeking an answer.

A number of circumstances, such as availability of good statistics, the prevalence of high social standards, the composition of the population which is in certain respects peculiar, etc., combine to make the experience of the state of California worthy of special study in this connection.

The growth of the population of that state has for a number of decades been in large part by immigration from other states, especially those east of the Mississippi River. This fact has created an opportunity of making a comparison such as we desire to make, in order to find an answer to the question that is before us, by noting the number of admissions to the state hospitals of California contributed by natives of the above-mentioned two groups of states who have taken up their residence in California.

If the incidence of mental disorders differs materially in these two groups of states, it would seem that the difference should be revealed by this comparison—one that is made

on the basis of a standard which, though not to be theoretically formulated, is nevertheless fairly definite, uniform and readily applicable, namely, the standard of the prevailing environmental conditions of California.

During the biennial period ending June 30, 1910,[1] the natives of the Northern group of states residing in California furnished 147.3 admissions to the state hospitals of California per hundred thousand of their general population. During the same period the natives of the Southern group of states furnished 166.7 admissions per hundred thousand: a difference of 13.1%.

In other words, as far as may be judged from these statistics, the Southern states east of the Mississippi River, which have had for many years, and still have, poorer and less adequate facilities for the care of their insane than the Northern, now show a higher incidence of mental disorders in their population.

Thus it would seem that the much greater relative number of insane in institutions in the Northern group of states is but an indication of a more thoroughly carried out policy of segregation, and appears to have already produced a demonstrable eugenic effect: for the application of a common standard to representative portions of the two population groups reveals evidence showing that the incidence of mental disorders is actually greater in the Southern group.

Similarly, it would appear that the progressive increase in the relative number of institution inmates, observed throughout the country during the past several decades, is also but an indication of more thorough segregation which has, in all probability, been attended by the same eugenic effect.

The conclusion seems justifiable, then, that such evidence as is available, far from showing that mental disorders are on the increase, tends to show rather that they are on the decline.

[1] Seventh Biennial Report of the State Commission in Lunacy of California.

CHAPTER XII

THE PRACTICE OF PSYCHIATRY (*Continued*)

PROPHYLAXIS IN PSYCHIATRY[1]

RELATIONSHIP BETWEEN BAD HEREDITY AND OTHER CAUSES—PREVENTION OF BAD HEREDITY—PREVENTION OF ALCOHOLISM, DRUG ADDICTIONS, AND SYPHILIS—THE INDIVIDUAL—IMMIGRATION

As stated in the chapter on etiology, amongst the many causes of mental disease may be distinguished some few that are *essential* from others that are merely *incidental* or *contributing*.

There are few persons, if indeed there are any, who are so fortunate as to go through life without being repeatedly subjected to the influence of some of the incidental causes: the prevention of mental disorders will consist largely in measures for combating the essential causes—heredity, alcohol and drug addictions, syphilis, and head injuries.

Measures for the prevention of mental disorders may be undertaken by the individual or by society. As far as the average healthy individual is concerned the measures are few and simple; it must, however, be noted as a fact which has been repeatedly demonstrated under the most varied conditions, that the great mass of individuals, even if made fully aware of all dangers, will not practice preventive measures in any systematic manner; this is perhaps due to a curious trait of human nature owing to which men are disinclined to believe that any evil may befall them and therefore have a tendency to take chances; further

[1] A. J. Rosanoff. *Causes and Prevention of Insanity.* The Long Island Med. Journ., Sept., 1915.

it must be remembered that the great causes of mental disorders appear in the shape of strong temptations which are difficult and for some impossible to resist. However this may be, those who are concerned with the problems of prophylaxis in psychiatry would be impractical if they relied entirely upon dissemination of knowledge on this subject among the people with the hope of thus reducing to a material extent the incidence of mental disorders. Dissemination of knowledge should, we believe, be regarded as a preliminary step which will make possible the application of large measures by society as a whole—for nothing short of such measures will constitute an effective system of mental hygiene.

Relationship between Bad Heredity and Other Causes.—The prevention of *bad heredity* affords a hope of reducing not only the constitutional mental disorders, but also those which develop on the basis of alcohol and drug addictions and of syphilis, as may be judged from the following considerations.

As regards *alcoholic psychoses*, it is not sufficient to know that they result from intemperance. In order to be able to deal properly with the problem of prevention an answer must be sought to the question, Why do some persons drink alcohol in injurious quantities?—The general view is that initiation into habits of intemperance occurs as a result of convivial customs or through bad associations, and that in such ways a craving is established which leads to the development of chronic alcoholism. This is truth, but not the whole truth; for in the midst of the same social conditions, favorable or unfavorable, it is as certain that some persons will become alcoholic as it is that others will not. The difference is between the persons.

During the fiscal year ending September 30, 1914, 56 cases of alcoholic psychoses were admitted to the Kings Park State Hospital; in 18 of these data concerning heredity and mental make-up of the patients were unascertained; of the remaining 38 cases no less than 31 presented either a

neuropathic family history, or an originally inferior mental make-up, or both; and only 7 gave a negative personal and family history.

The conditions under which such hospital statistics are compiled as a rule give rise to error in but one direction, namely, in the direction of omitting pertinent facts of family or personal history; thus tending to lead to an underestimation of the case from this point of view. Considering this, the remarkable showing of the figures must give one the feeling that the tendency to drink alcohol in amounts sufficient to produce mental disease is largely a neuropathic manifestation.

A study of this subject, made by Dr. D. Heron [1] and published recently from the Galton Laboratory of Eugenics at the University of London, has yielded a similar conclusion: "We are on fairly safe ground in asserting that the relation between inebriety and mental defect is about 0.76. We have thus reached a definite measure of a relationship on which every authority on alcoholism has laid the greatest possible stress." "On the one hand, mental condition is usually regarded as being directly affected by alcoholic excess, and on the other hand the extent of the individual's education is very largely determined by causes which are pre-alcoholic; yet we find here that there is a close relationship between the two characters, and this is strongly in favor of the view that the defective mental condition of these inebriates, like the extent of their education, is pre-alcoholic and that the alcoholism flows from a pre-existing mental defect, not the mental defect from the alcoholism." "All this lends support to the view that the mental defect of the inebriate is not an actual growth; it is born, not bred; that 'inebriety is more an incident in the life of the inebriate than the cause of his mental defect.'"

What has been said about alcoholism applies with equal force to *drug addictions*.

[1] Eugenics Laboratory Memoirs, xvii: *A Second Study of Extreme Alcoholism in Adults.* London, 1912.

As regards *syphilis*, in this connection, it is necessary to consider before all the manner in which it is spread so widely through the population.

Syphilitic infection, as is well known, may be of non-venereal as well as of venereal origin. Thus, of 887 cases reported by Fournier,[1] 45 were of non-venereal origin, among these being cases of inherited syphilis, of infection of wet-nurses by sucklings, midwives by women in labor, etc. Of the cases of venereal origin, not all result from immoral relations. Thus Fournier[2] estimates that of all cases in women the infection in 19% is acquired by married women from their husbands. But even in cases in which the infection is acquired innocently, it can usually be traced indirectly to immoral sexual relations, particularly to prostitution, as its original source.

The prevention of syphilis and with it of psychoses of syphilitic origin is, therefore, closely linked to the prevention or control of prostitution.

To what extent can prostitution be controlled?

First of all, it must be noted that at no time has any state or nation as yet succeeded in abolishing prostitution, and as late as 1902 a Committee of Fifteen organized in New York for the purpose of investigating the social evil, were led in their report to express the view that the summary extirpation of prostitution "in the present state of the moral evolution of the race, is as yet impossible."[3]

Since that time, however, important additions have been made to our knowledge of prostitution, so that to-day the case no longer seems so hopeless. The most significant contribution consists in the discovery of the close relationship existing between prostitution and feeble-mindedness and other mental disorders.

This relationship has been carefully studied by a special

[1] Fournier. *The Treatment and Prophylaxis of Syphilis.* English translation by C. F. Marshall. New York, 1907. P. 348.

[2] *Loc. cit.*, p. 351.

[3] *The Social Evil.* New York, 1902. (G. P. Putnam's Sons) P. 178.

commission created for that purpose by an act of the House of Representatives of the State of Massachusetts.[1] We would quote the following from their highly interesting official report:

"The women examined were in three groups: young girls under sentence in the State Industrial School for Girls, the House of Refuge, and the Welcome House; those just arrested and awaiting trial in the Suffolk House of Detention in Boston; women serving sentenee in the State Reformatory for Women, the Suffolk County Jail, and the Suffolk House of Correction.

"These three groups represent the young girls who have just begun prostitution, the women plying their trade on the streets at the present time and the women who are old offenders. The houses of prostitution, lodging houses, hotels and cafés named by these women as the places where they plied their trade are the same as those noted by the field investigators employed by the commission.

"The Binet tests were applied to 289 of the 300 women examined, and other psychologieal tests were used in doubtful cases.

"Of the 300 prostitutes, 154, or 51% were feeble-minded and 11, or 3% were insane. All doubtful cases were reeorded as normal. The mental defect of those 154 women was so pronounced and evident as to warrant the legal commitment of each one as a feeble-minded person or as a defective delinquent. At the Massachusetts School for the Feeble-minded there are an equal number of women and girl inmates, medically and legally certified as feeble-minded, who are of equal or superior mental capacity.

"The 135 women designated as normal as a class were of distinctly inferior intelligenee. More time for study of these women, more eomplete histories of their life in the community and opportunity for more elaborate psychological tests might verify the belief that many of them also were feeble-minded or insane.

"Some of the women seen at the Detention House were so under the influence of drugs or aleohol as to make it impossible to study their mental condition. Others at the Detention House and in the prisons had used alcohol to excess for years, and in the time available it was impossible to differentiate between aleoholic deterioration amd mental defect. These drunken, alcoholie and drug-stupefied women were all recorded as normal.

"Of the 135 women rated as normal, only a few ever read a news-

[1] Report of the Commission for the Investigation of the White Slave Traffie, so-called. February, 1914. House, No. 2281, State of Massachusetts.

paper or a book, or had any real knowledge of current events, or could converse intelligently upon any but the most trivial subjects. Not more than six of the entire number seemed to have really good minds.

" It has long been held that prostitution always has existed and always will exist, and that all remedies will be ineffective and of no avail, because it represents a variation of the most fundamental human instinct.

" Recent studies of prostitution and prostitutes in other cities, states, and countries, and, in connection with this investigation, the study and analysis of 300 prostitutes individually examined for the commission, the observation of prostitutes and prostitution, and of the immoral young girls who have not entered prostitution in cities and towns all over the State, have convinced the commission that this evil is susceptible of successful attack and treatment. The fact that one-half of the women examined were actually feeble-minded clears the way for successful treatment for this portion of this class. The mental status of the prostitutes under arrest should be determined, and such of them as are found to be feeble-minded or defective delinquents should be placed under custodial treatment. Thus would these women themselves be saved from an evil fate, pimps and procurers would lose their willing prey, and a non-self-supporting class who find in prostitution their only way of earning a living would be taken out of the community.

" The recognition of feeble-minded girls at an early age in the public schools, and proper provision for their protection in the community or custodial care in an institution, would prevent much of the observed immorality among young girls and the resulting temptations to boys. Precocious sex interests and practices are well-known symptoms of feeble-mindedness."

The situation, then, may be summarized as follows: at least three-fourths of all cases of mental disorders occur on the basis of bad heredity, alcoholism, drug addictions, or syphilis; an individual who is of normal ancestry, abstains from alcohol and habit forming drugs and remains free from syphilitic infection is not seriously threatened with a mental disorder. But since alcoholism and syphilis are, in their turn, so generally connected either directly or indirectly with inherent mental defectiveness, it follows that heredity is, as long taught with characteristic clearness of thought and diction by the French school of psychiatry, the cause of causes of mental disorders.

It may safely be said, therefore, that *a movement for the prevention of mental disorders will lead the race in no mistaken path if it concentrates the bulk of its energies on the problem of bad heredity.*

Prevention of Bad Heredity.—The means that have been suggested for combating bad heredity are legal restriction of marriage, surgical sterilization, and segregation. This would, perhaps, hardly be the place for a full discussion of the advantages and disadvantages of these measures; nor is it to be assumed that any one of them is to be adopted necessarily to the complete exclusion of the others. Suffice it to say here that the main drawback of marriage laws in this connection is their ineffectiveness;[1] and that to sterilization there are moral, religious, legal, and even scientific objections which render it largely unacceptable to public opinion. On the other hand, segregation, though also opposed by some, is evidently much more generally acceptable, as is shown by the fact that, quite independently of any consciously eugenic movement, its practice has made great headway during the past several decades.

We may conclude, therefore, that, unlike other eugenic measures that have been proposed, segregation is an old practice which has been tried out everywhere and to which no effective objections have been raised either on religious, legal, or humanitarian grounds; it has had of late a remarkable growth; and it may be anticipated that with the growth of urban centers, progress in popular education, improvement of methods of financing, and the rise in standards of institution care will come vast possibilities of further growth.[2]

If mental disorders are to so large an extent a heritage from

[1] Adolf Meyer. *The Right to Marry. What Can a Democratic Civilization Do About Heredity and Child Welfare?* The Survey, Vol. xxxvi, No. 10. Re-published in Mental Hygiene, Jan., 1919.

[2] A. J. Rosanoff. *A Study of Eugenic Forces: Particularly of Social Conditions which Bring about the Segregation of Neuropathic Persons in Special Institutions.* Amer. Journ. of Insanity, Oct., 1915.

past generations, resulting from untold centuries of neglect of segregation; and if the very incomplete segregation that has been practiced in but two or three generations can already be shown to have made an impression on this ancient problem (see p. 164); then it would seem that we have at last arrived at a point where we need to consider but ways and means; for we are in a position to say to the people and to legislatures, *Mental health is purchasable; the prevalence of mental disorders can be reduced for coming generations with the aid of dollars and cents spent for segregation in this generation.*

In discussing the feasibility of segregation the questions are often raised, What persons should be selected for segregation? How should the selection be made? How can errors be avoided?—The implication is that, inasmuch as it is not possible to sharply distinguish mentally abnormal from normal persons, segregation might in practice entail much arbitrariness and injustice.

The answer is that these questions are purely academic; in practice they do not arise in any troublesome manner. For instance, out of a total of 8700 cases admitted to the New York State hospitals during the year ending June 30, 1918, 96 were eventually classified as " Not insane." These, however, were thus classified not because they presented no mental abnormality, but because their abnormality was of such nature as not to be included within the statutory definition of cases entitled to treatment in state hospitals. They were further classified as follows: [1]

TABLE 7.

Not insane, epilepsy	2
" " alcoholism	22
" " drug addiction	6
" " constitutional psychopathic inferiority	17
" " mental deficiency	19
" " others	30

[1] Thirtieth Annual Report of the N. Y. State Hospital Commission, Albany, 1919.

The experience of institutions for the feeble-minded, epileptic, and inebriate has been the same.

Moreover, there are many safeguards in the practice of segregation to rectify errors made in rare cases. The admission of a patient to an institution is not an irrevocable step. It is but the beginning of a more intensive investigation, observation and treatment of his case, the object of which is to help him, if possible, to such a readjustment as would enable him to return to normal life again. Through a liberal parole system he is given opportunities of trying life outside again under the most favorable conditions of supervision, employment, and assistance that could be created for him. Under such conditions many patients are after a short time discharged from institutions. If eventually, after repeated trials of this kind, the patient has to return to the institution for permanent segregation, it is not because a certain diagnosis of mental disorder has been made; or because someone, however expert, has judged him to require segregation; but because the need of segregation in his case has forced itself to recognition by a full demonstration of his utter incapability of achieving a social adjustment.

To-day the great obstacle to more complete segregation is to be found not in any difficulty of selection. The obstacle is an economic one, limiting the states' facilities for segregation. Not even the most progressive states possess as yet adequate institutional capacity. "Thus, the State of New York had, according to the Thirteenth U. S. Census in 1910, institutional provision for 396.3 insane, epileptic, and mentally defective persons per 100,000 of its total population. In Nassau County it was estimated that 816.7 persons per 100,000 of total population require institutional custody."[1]

It will be judged, from what has already been said, that the proposal to extend the scope and practice of

[1] A. J. Rosanoff. *Survey of Mental Disorders in Nassau County, N. Y.* Report published by The National Committee for Mental Hygiene, New York, 1917.

segregation does not imply the forced segregation of every person in whom the existence of a neuropathic condition might be established by medical diagnosis. It is well known that grave neuropathic conditions, notably manic-depressive psychoses and epilepsy, are not incompatible with the highest degree of intellectual efficiency. As striking instances might be mentioned the cases of William Cowper, the English poet, who suffered from many severe manic-depressive attacks; Julius Robert Mayer, the physicist and discoverer of the principle of conservation of energy, who was similarly afflicted; and Gustave Flaubert, the great French novelist, who suffered from epilepsy.[1]

Not insanity, epilepsy, or mental deficiency, as such, but lack of capacity for social adjustment is the proper basis for segregation.

Prevention of Alcoholism, Drug Addictions, and Syphilis.—Direct efforts for the prevention of alcoholism, drug addictions, and syphilis, independently of the measures for combating bad heredity, are by no means to be neglected.

Abstinence.—The most trustworthy experimental data seem to show that even moderate indulgence in alcohol, though producing in the subject a sense of well-being and of increased physical and mental ability, in reality causes impairment of muscular power and coördination and of mental efficiency.[2] In persons of neurotic constitution comparatively slight indulgence often causes severe mental disturbance.

[1] A. J. Rosanoff. *Intellectual Efficiency in Relation to Insanity.* Amer. Journ. of Insanity, July, 1916.

[2] L. Schneider. *Alkohol und Muskelkraft.* Pflügers Arch. f. d. ges. Physiol., Vol. xciii, p. 451.—M. Mayer. *Ueber die Beeinflussung der Schrift durch den Alkohol.* Kraepelins Psychol. Arb., Vol. III, p. 535.—G. Aschaffenburg. *Praktische Arbeit unter Alkoholwirkung.* Kraepelins Psychol. Arb., Vol. I, p. 608.—A. Smith. *Ueber die Beeinflussung einfacher psychischer Vorgänge durch chronische Alkoholvergiftung.* Br. üb. d. V. intern. Kongr. z. Bekämpf. d. Missbr. geist. Getränke. Basel, 1896, p. 341.—E. Kürz and E. Kraepelin. *Ueber die Beeinflussung psychischer Vorgänge durch regelmässigen Alkoholismus.* Kraepelins Psychol. Arb., Vol. III, p. 417.

Those who favor temperance rather than abstinence do so mainly on the basis of the usefulness of alcohol as a food and as a sedative contributing to the recuperative effect of rest by promoting complete relaxation. It is not to be disputed that alcohol does possess these beneficial qualities, but it is for many not possible to derive the benefit and yet escape the harm from using it. Moreover, moderate indulgence, if regular, leads but too often to the development of uncontrollable craving, increase of dosage, and ultimately to chronic alcoholism. It need hardly be added that alcohol either as a food or as a sedative is not a physiological necessity.

Therefore the advice of the physician to his patient must usually be: *total abstinence without compromise.*

Of measures that may be employed by society the most important is *dissemination of the knowledge of the true effect of alcohol,* which should constitute a part of the program of all public schools. It is necessary before all to dispel the prevailing notions that alcohol is harmful only when taken in excess and that, taken in moderation, it is beneficial and even necessary to the laborer or artisan.

The next in importance are *legislative measures.* As having been actually proved to be in some degree effective may be mentioned: (1) The Gothenburg system, (2) prohibition, and (3) local option.

The Gothenburg system was first instituted in Sweden, and has since been adopted by Norway and Finland. The Swedish Law of 1855 gives to each municipality the right of prohibiting within its jurisdiction the sale of liquor over the bar or in stores in quantities under forty liters. Retail licenses in limited number—according to population—are awarded by the municipal authorities at public sale to the highest bidder, provided he be a person of good reputation. The law provides further that retail licenses may be awarded to societies, thus making it possible for public-spirited citizens to form organizations for the purpose of securing the licenses which are at the disposal of the municipal authorities and

thus assuming control of the entire retail liquor trade. Thus was founded for the first time in the city of Gothenburg "The Gothenburg Retail Liquor Stock Company." This and other similar companies derive, of course, no profit from the trade, the profits going in part (60-80%) into the city treasury and in part (20–40%) into the state treasury. The aim of such companies, in contrast with that of private liquor dealers, is to reduce the consumption of liquors; for that purpose they have established popular price restaurants, reading rooms, etc., for working people.

The results of this legislation may be judged from the following statistics.[1]

Prior to 1855 liquor could be purchased in Sweden in any hamlet. In 1869 there was only one barroom or liquor store to 8,028 inhabitants; in 1880 only one to 13,450 inhabitants.

There are 2400 separate municipalities in Sweden; of these 1800 have entirely abolished barrooms and retail liquor stores.

The consumption of liquor in Sweden in 1824 was 46 liters per capita, in 1851 it was 22 liters, and in 1896 it had become reduced to 7.2 liters.

Prior to enactment of the laws of 1855 from 25% to 30% of all male cases admitted to hospitals for the insane were due to intemperance. Following the enactment of those laws this percentage gradually became less, and from 1865 until 1899 it varied between 5.2% and 7.19%.

Prohibition has been tried in several states. In some of these states the prohibition laws have been repealed (Connecticut, Vermont, Massachusetts); in others they have been but recently enacted (Alabama, Georgia, Oklahoma); in still others they have been in force for many years (in Maine since 1851, in Kansas since 1880, in North Dakota since 1889), so that they may be assumed to have been given a thorough practical trial.

[1] A. Baer and B. Laquer. *Die Trunksucht und ihre Abwehr.* Berlin and Vienna, 1907.

Practical difficulties of enforcing state prohibition laws reduce materially the possible effectiveness of such laws.

Nevertheless it has been amply shown that crime and pauperism have been reduced wherever prohibition laws have been enacted.[1]

The effect of no license under *local option* is similar to that of prohibition; that is to say, drunkenness, crime, and pauperism are undoubtedly reduced, but the incidence of insanity is but slightly, if at all, affected.

The following table shows the reduction of drunkenness which resulted from no license under local option in several cities in Massachusetts.

TABLE 8.

Cities.	Arrests for Drunkenness.			
	License.		No License.	
	Year.	Number of Arrests.	Year.	Number of Arrests.
Brockton................	1898	1627	1899	455
Waltham................	1900	634	1901	179
Taunton................	1901	1202	1900	482
Chelsea................	1902	1246	1901	398
Newburyport............	1901	673	1902	150
Lowell................	1902	4077	1903	2304
Salem................	1903	1432	1904	503
Woburn..	1903	842	1904	204
Fitchburg............	1905	1160	1906	359

It would be too early as yet to size up the effects of the more recently enacted national prohibition.

[1] Year Book of the Anti-Saloon League, 1908.—Twenty-sixth Annual Report of the Massachusetts Bureau of Labor. Boston, 1896. —Twenty-seventh Annual Report of the Massachusetts State Board of Charities, 1907.

As regards *drug addictions*, the solution of the problem would seem to be simple in comparison with the problem of alcoholism. No considerable opposition would be encountered to legislation which would make the importation, manufacture, distribution, and sale of habit-forming drugs a monopoly of the federal government and which would at the same time prohibit any unauthorized traffic in them.

It seems strange that in the world campaigns against *syphilis* there should have been until recently complete neglect of measures which have been so successful in the prevention of other communicable diseases, namely, the compulsory reporting of all cases, regardless of the manner or source of infection, and their hospitalization, if necessary, during the period of greatest infectiousness.

Local inunction with calomel ointment applied within an hour or even within several hours of exposure to the infection may prevent the development of syphilis.[1]

For the prevention of hereditary syphilis Fournier gives the following rule: "When a woman is pregnant with a child threatened, by paternal antecedents, with syphilitic heredity, syphilitic treatment of the mother, although healthy, constitutes for this child a real and powerful safeguard for which there is a precise and formal indication."[2]

Finally there can be no doubt that in cases of syphilitic infection *promptness* and *thoroughness* of treatment, until the Wassermann reaction and cerebro-spinal fluid findings become and remain negative, is capable of greatly reducing or even eliminating the danger of involvement of the nervous system.

Head Injuries.—There is but little to be said with reference to head injuries which, like other injuries resulting

[1] Articles by L. W. Harrison and C. N. Fiske in *A System of Syphilis*, edited by Power and Murphy. London, 1910. Vol. VI, pp. 137 and 308.—M. F. Gates. *The Prophylaxis of Gonorrhœa.* The Therapeutic Gazette, Jan., 1911.

[2] Fournier. *The Treatment and Prophylaxis of Syphilis.* English translation by C. F. Marshall. New York, 1907. P. 447.

in either disability or death, have become common as a result of the great modern development of industries, means of transportation, etc. It may be pointed out, however, that in the United States, owing, probably, to imperfect legislative protection, serious accidents are needlessly frequent, as may be judged from the example furnished by American and British railroad statistics. These, for the year 1906,[1] are given in the following table:

TABLE 9.

	American Railroads.	British Railroads.
Total number of passengers carried....	800,000,000	1,200,000,000
Total miles of track..................	200,000	27,000
Number of collisions and derailments...	13,455	239
Number of passengers killed..........	146	58
Number of passengers injured.........	6,000	631
Number of employees killed..........	879	13
Number of employees injured.........	7,483	140

The Individual.—It has already been said that an individual, who comes from normal stock, abstains from alcohol and habit-forming drugs, is free from syphilis, and escapes accidental head injury, is not threatened with mental disorder.

It is not so with the neuropathic individual: for him every feature of life in society presents possible dangers. From childhood up the adjustment between him and his environment must be nicely controlled if the danger of a mental breakdown is to be minimized; his bringing-up at home, his education at school, his sexual life, his career, his social and family relations are great matters for special adjustment, particularly with the ends in view of proper habit training, avoidance of the incidental causes referred to in the chapter on Etiology as possessing quasi-specific potency

[1] J. O. Fagan. *Confessions of a Railroad Signalman.* Boston and New York, 1908.

in the production of mental alienation, and prompt institution of treatment upon the appearance of any symptoms.

Immigration.—The importance for this country of immigration in connection with the problems of the prevalence and prevention of mental disorders has already been pointed out in the chapter on Etiology. Although the conclusion has been drawn that there is no evidence to show that there is a greater proneness toward mental disease in the foreign-born than in the native population, this is not to be construed as arguing in favor of relaxing the efforts of keeping out all mentally defective immigrants; on the contrary, whether mental disease be relatively frequent or rare among immigrants, the welfare of this country demands that defective persons be prevented from entering and remaining in it and that the facilities for their detection and deportation be perfected and increased rather than reduced. On the other hand, a policy of general restriction of immigration, such as has been advocated by some, would seem to be unnecessary and unjustified as far as the interests of eugenics and mental hygiene in this country are concerned.

CHAPTER XIII

THE PRACTICE OF PSYCHIATRY (*Continued*)

COMMITMENT—LEGAL COMPETENCE—TESTAMENTARY CAPACITY—CRIMINAL RESPONSIBILITY—RELATIONSHIP BETWEEN VICE, CRIME AND MENTAL DISORDERS

Medico-Legal Questions in Psychiatry.—The most important medico-legal questions that may arise in connection with cases of alleged mental disorders are those of necessity of commitment, competence in the management of one's own affairs, testamentary capacity, and criminal responsibility. The mere fact of the existence of a mental disorder, established by a medical diagnosis, is not sufficient to settle these questions.

Commitment.—The question of necessity of commitment has already been touched on. The tendency in leading states is to limit as far as possible the practice of committing cases, allowing any suitable case to be admitted to a state hospital on voluntary application, at any time, without special formality.

Psychiatrists are looking forward to even greater facility of obtaining treatment for cases of mental disorders in the future in psychopathic wards to be established in connection with general hospitals: "The details of transfer from the psychopathic ward to the large state institutions should be made as simple as possible. Transfer should be made effective on a certificate of two properly qualified physicians and the matter should not have to come into court at all unless it is brought there by the patient, his relatives, or some friends on his behalf. I would not close the courts to the so-called insane by any means, but I would not insist

on a legal process, whether the patient wanted it or not; I would not insist, so to speak, on cramming an alleged constitutional right down the patient's throat at the expense of his life. We see to-day this process of commitment going on where nobody wants it. The patient does not want it, the patient's friends and relatives do not want it, and anybody who stands and watches it proceed recognizes on the face of it that it is a farce. I would, therefore, proceed in the matter of commitment in the simplest way. Leave the courts accessible to the patient if he wants to appeal for relief, and it will be surprising how rare such appeals will be." [1]

Legal Competence—Testamentary Capacity.—As regards competence in the management of one's own affairs and testamentary capacity, no difficulty is experienced in the majority of cases of pronounced mental disorder; difficulty is met with rather in connection with milder cases in which there may be room for legitimate difference of opinion. In cases in which a direct examination of the person whose mentality is in question is not practicable, the opinion of a psychiatrist is of but little more value than that of a lay person; in such cases it would seem best to place the burden of proof on those who allege incompetence or limited testamentary capacity, and to require as proof not merely opinion, however expert, but instances of actual business mismanagement of obviously abnormal degree or nature. Where there is opportunity for direct examination the testimony of a psychiatrist may be of determining value, mainly for the reason that he is better able than a layman to establish or eliminate, as the case may be, the existence of defects of memory, judgment, affectivity, etc., which would have a bearing on the question at issue. Here again facts, as revealed by the examination, rather than opinions, however expert, will be of greatest assistance to the judicial authorities in drawing a just conclusion. It need hardly be said

[1] Wm. A. White. *Dividing Line between General Hospital and Hospital for Insane.* The Modern Hospital, March, 1914.

that here, as under other conditions, the testimony of witnesses, including expert witnesses, is of value according to the degree of freedom from bias. It is, of course, not legal for a court to rule out the testimony furnished by witnesses retained either by the plaintiff or by the defendant; but it is possible, and desirable in the cause of justice, for the court to call experts in order to be sure of securing testimony that is free from even unconscious bias.

A psychiatrist called as an expert ought by right to refrain from giving an opinion on the main question at issue, that of competence or testamentary capacity, that being, strictly speaking, not a medical or scientific question at all, but a question of common sense for the court to determine. The data revealed by his examination and his judgment of their pathological significance are all that he can contribute as an expert; an opinion on competence or testamentary capacity that might be elicited from him should not be considered as being of greater value than one offered by anyone else.

Criminal Responsibility.—Perhaps the most difficult position in which a psychiatrist may find himself is when he is consulted on the question of criminal responsibility. Here the difficulty lies not so much in the nature of the question as in the difference between the current legal and the scientific conceptions of responsibility.

The current legal conception is based on the metaphysical theory of freedom of the will; the individual must exercise his will under the guidance of ethical principles; he is responsible for his acts unless, owing to immaturity or mental disease, he is incapable of distinguishing right from wrong and is thus bereft of proper guidance; when no such incapacity can be shown he must undergo punishment in proportion to the gravity of his crime; this punishment or retribution, which is nothing but a systematization of the original impulse of revenge, is now most frequently justified as a deterrent measure; by instilling a fear of similar punishment, it is supposed, society protects

itself against repetitions of the crime; under the influence of this fear responsible persons, i.e., those capable of distinguishing right from wrong, will refrain from doing wrong.

The psychiatrist, when consulted in a criminal case, is not asked to state in a general way whether or not in his opinion the accused is insane, but whether he is insane in the special legal sense with reference to criminal responsibility, i.e., incapable of distinguishing right from wrong.

The scientific conception of responsibility is, of course, very different; the metaphysical theory of freedom of the will has no place in science; the phenomena of the will, like other natural phenomena, are subject to natural laws and are determined by antecedents, such as heredity, education, various environmental influences, and events immediately preceding a given act under consideration, that is to say, factors for the most part beyond the control of the individual; responsibility, therefore, in the sense of liability to profitless suffering in retribution for wrongdoing, does not exist scientifically in any case, sane or insane.

On the other hand, everybody, sane or insane, is responsible in the sense of being liable to forfeit his liberty, property, or the results of his labor when necessary for the protection of the rights of others or for the restoration of damage caused by him.

It is true that the tendency of modern times is to eliminate as far as possible the element of retribution in the treatment of crime; yet the object of a court proceeding in a criminal case is to-day still the determination of the degree of guilt of the accused, i.e., of the amount of punishment to which he should be sentenced. As long as such is the case, it seems to us, psychiatrists cannot consistently take part in the proceeding. They can assist only in *a scientific investigation* of a case of crime for the purpose of determining its complex of causes, as far as it may be possible to do so, and of thus gaining guidance for measures of prevention, such as temporary or permanent segregation, etc.

The object of the court proceeding, from such a point of

view, should be to determine whether or not the accused has committed the crime as alleged and, if so, the amount of damage as well as it can be estimated in terms of money value and the extent to which it is possible for the damage to be made good either by attaching the property of the author of the crime or by a judgment against the products of his labor.

The scientific attitude in relation to the question of criminal responsibility would eliminate the incentives for the troublesome plea of insanity in criminal cases, on the one hand, by ignoring the question of guilt and, on the other hand, by enforcing a responsibility for damage in all cases, sane or insane.

Relationship between Vice, Crime, and Mental Disorders.—The almost exclusive preoccupation of criminal courts with the question of guilt and punishment has led to their overlooking largely the important relationship which there is between vice and crime and mental disorders.[1] The evidence of such a relationship between prostitution and mental defectiveness has already been given in the preceding section of this chapter, in connection with the discussion of the prophylaxis of syphilis.

Equally striking is the evidence of the relationship which exists between mental disorders and *crime.* As regards feeble-mindedness alone, for instance, Goddard[2] cites the following statistics of percentages of defectives found in various reformatories and institutions for delinquents by the systematic application of Binet tests: Rahway Reformatory, New Jersey, 46; Geneva, Illinois, 89; Ohio Boys' School, 70; Ohio Girls' School, 70; Virginia, three reformatories, 79.

The statistics of the United States Census pertaining to insanity and crime are also of interest in this connection.

[1] A. J. Rosanoff. *A Program of Psychiatric Progress.* Med. Record, Feb. 20, 1915.

[2] H. H. Goddard. *Feeble-mindedness.* New York, 1914.

The States of this country may be divided into two groups according to the number of inmates in insane hospitals in proportion to the general population. Since, for the present purpose, this is done to facilitate the study of the relationship which exists between crime and insanity, it would seem best to take into consideration only the male population at large and the male asylum and prison inmates: crime is not nearly so common, whether as a neuropathic manifestation or otherwise, among women as among men, the counterpart among women being sexual immorality, prostitution, illegitimacy, etc.

The first group of states, comprising Alabama, Arkansas, Colorado, Florida, Georgia, Idaho, Louisiana, Mississippi, New Mexico, North Carolina, North Dakota, Oklahoma, South Carolina, Tennessee, Texas, Utah, West Virginia, and Wyoming, has a total male population 10 years of age or over of 9,705,527; each of these states has less than 200 male asylum inmates per 100,000 of the male population 10 years of age or over, the average for the entire group being 140.9.

In this group of states the number of inmates in prisons, penitentiaries, jails, and workhouses, not including juvenile delinquents, is 31,290, i.e., 322.4 per 100,000 of the general population 10 years of age or over.

The second group of states, comprising Arizona, California, Connecticut, Delaware, Illinois, Indiana, Iowa, Kansas, Kentucky, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New York, Ohio, Oregon, Pennsylvania, Rhode Island, South Dakota, Vermont, Virginia, Washington, and Wisconsin, has a total male population 10 years of age or over of 27,190,148; each of these states has more than 200 male asylum inmates per 100,000 of the male population 10 years of age or over, the average for the entire group being 304.7.

In this group of states the number of inmates in prisons, penitentiaries, jails, and workhouses, not including juvenile

delinquents, is 71,482, i.e., 262.9 per 100,000 of the general population 10 years of age or over.

The contrast between the two groups of states as regards the relative number of prisoners is sufficiently striking as revealed by the census statistics. But it is probable that the excess of crime in the first group of states is but partly revealed in these statistics; for it seems reasonable to assume that the facilities for the detection and prosecution of crime are in these states, like other social institutions, inferior as compared with those of the second group of states, so that a greater amount of crime remains undetected, and unrepresented in the statistics of penal institutions.

However this may be, it seems certain that the inadequacy of the provisions for the care and custody of cases of mental disorder in the first group of states, regarded from its financial aspect alone, does not carry with it the advantage of economy, for what may be saved in expenditures for the maintenance of the insane is lost in increased expenditures for the maintenance of convicted criminals; it is, indeed, not unlikely that the loss is far greater than the saving.

To give the student a more direct view of the evidence showing a relationship between crime and mental disorders we could do no better than to quote from a report prepared by Dr. Anne Moore, in which several pages are devoted to a consideration of the crime of arson.[1]

"Arson is a common crime among the feeble-minded. . . . Many times thousands of dollars' worth of property are destroyed and many lives endangered before legal proof of guilt is established. On conviction these persons are often committed to penal institutions, only to be paroled and set free to repeat the crime; or they are left to serve long sentences which on their release do not act as a deterrent. The Fire Marshal of New York City tells me that a sufficient number of cases of pyromania have come to his attention to fill a special institution. Two cases have come to my knowledge in which feeble-minded children have set fire to the clothing of other children with fatal consequences.

[1] *The Feeble-minded in New York.* A report prepared for the Public Education Association of New York by Anne Moore. New York, 1911.

" Between the dates of February 1, 1910, and July 12, 1910, sixteen fires occurred in the district bounded by Fifth and Lexington avenues and 108th and 119th streets, all in twenty-family, five-story tenements, and all of similar incendiary origin. These fires were traced to a feeble-minded youth who had no motive for the deed except a desire for excitement. When he visited one of the buildings to deliver goods his method was to light a bundle of papers which he had previously saturated with kerosene from a bottle which he carried with him, and leave them in the hallway, in a corner of the stairway, or in the cellar. He was caught and convicted on the sixteenth fire. He was declared insane and is now confined in the Central Islip State Hospital.

" A feeble-minded man, 25 years of age, started 45 fires within three months. The loss was estimated at a quarter of a million dollars. He usually left something burning in the airshaft or wood-bin. At his trial he was declared sane and was sent to Elmira. After 13 months he was released on parole and won his absolute release.

" A feeble-minded boy, living in Massachusetts, set fire to his grandfather's house. He saved himself by jumping from the upper window into a cherry tree. Afterwards, he set fire to a stable in Gloucester, Mass., and was sent to a reform school for two and a half years. After his release he set on fire, one by one, a row of houses owned by different clergymen, called ' holy row.' Later he burned a house belonging to the father of the district attorney, was caught, and convicted. He spent four years in Charlestown Prison. He became religious and was paroled on condition that he go to another state. He came to New York and for a time was under Mrs. Booth's care. Afterwards he set fire to a barn and to the Bayside Yacht Club. He was caught and convicted. He is now in Sing Sing.

" What this means in money may be gathered from following the evidence and proceedings in any case of arson, a common crime among mental defectives.

" (1) A building is set on fire with attendant danger to its dwellers, and loss of property to them and the owner.

" (2) The fire department is called out. Usually six companies, involving one battalion chief, 72 men, 4 engines, and 2 trucks, the police reserves, usually about 20 men, and an insurance fire patrol wagon with an officer and 10 men, respond to an alarm.

" (3) The offender is arrested by a police officer, after examination of material witnesses by a fire marshal.

" (4) After being taken to the station house the incendiary must go before the magistrate; and if brought to trial, with its attendant delays, much time of many different salaried officers is consumed as well as that of the material witnesses.

" (5) After conviction and before sentence is passed a probation

officer may be asked to look into the history of the case, which will take at least a week. The sentence may be any length of time, up to 40 years.

" All this expensive machinery need not have been used in the case of feeble-minded incendiaries if they had been cared for in institutions at the proper time."

CHAPTER XIV

THE PRACTICE OF PSYCHIATRY (*Concluded*)

EXTRAMURAL PSYCHIATRY

TWENTY or twenty-five years ago it was a common assumption that psychiatric clinical material was mainly contained in institutions for the insane. With increasing knowledge of mental disorders, however, it eventually became evident that vast amounts of psychiatric material, often unrecognized as such, existed outside of institutions. The question thus arose, *What is the precise amount and nature of the extramural psychiatric material?*

To find an answer to this question surveys of mental disorders have been undertaken in various communities. One such survey, recently carried out in Nassau County, N. Y., under the auspices of The National Committee for Mental Hygiene, embodies method and viewpoint gained from the experiences of similar previous undertakings. The following account is abstracted from the report of that survey.[1]

To-day the question of the prevalence of mental disorders is no longer an academic one. One no longer asks: What is the percentage of "insane," or "feeble-minded," or "mentally defective" persons in a given community? But rather, What instances of social maladjustment, sufficiently marked to have become the concern of public authorities, are, upon investigation, to be attributed mainly or in large measure to mental disorders?

All efforts hitherto made in coping with the problems of vice, crime, pauperism, and disease have met everywhere

[1] A. J. Rosanoff. *Survey of Mental Disorders in Nassau County, N. Y.* 1917.

with only partial success at best; the difficulty has been due to lack of any clear knowledge of underlying causes. In the meantime a great deal of evidence has been accumulated in the course of psychiatric progress showing that these social phenomena are in large part causatively related to mental disorders; thus the main object of the survey became to study the nature of this relationship.

In all 1592 mentally abnormal individuals were found, constituting 1.37% of the total population.[1] These were classified as follows:

TABLE 10.

Insane	394
Epileptic	72
Feeble-minded	634
Constitutional psychopathic states	492

The same cases were also classified sociologically as follows:

TABLE 11.

Retardation in school, truancy, unruliness, etc.	189
Sex immorality	116
Criminal tendency	81
Dependency	280
Inebriety, including drug addictions	324
Other social maladjustments	439
No maladjustment	163

Of these cases 946, or 0.82% of the entire population, were judged to require institutional care, whereas only 365 were receiving such care.

The survey has shown very clearly that for the bulk of cases presenting psychiatric problems the benefit of psychiatric study, judgment, and treatment is not available. These cases are now in the hands of the police, overseers of the poor, justices of the peace, church and private charitable organizations, and general medical practitioners.

[1] These figures do not include an estimate of cases in the schools, which would raise the percentage to 1.72.

Similarly, psychiatric problems in cases among school children are left without attention or, seemingly, even deliberately avoided. The medical examination of children in schools takes into account height, weight, chest expansion, eyes, ears, nose, tonsils, teeth, etc., but not mental condition. Save by way of rare exception, where a special class is provided for persistently retarded children, mental abnormalities or peculiarities receive no attention on the part of the educational authorities. This is prejudicial not only to the interests of the abnormal children, but of the others as well. It is clear that more special classes are required; small school districts could form unions for the joint establishment and management of such special classes.

An extraordinary opportunity of gaining an idea of the magnitude and nature of extramural psychiatric problems was furnished by the experience in the organization of the National Army in the World War. The following statistics represent the numbers of various neuro-psychiatric cases per 100,000 recruits discovered and rejected by local draft boards or medical officers in training camps:[1]

TABLE 12.

Mental deficiency	1445
Epilepsy	516
Constitutional psychopathic states	55
Dementia præcox	77
Manic-depressive psychoses	21
Other psychoses	137
Psychoneuroses	153
Alcoholic psychoses	3
General paralysis	9
Malingering	1

There is not a general hospital, health board, army post, school, charitable institution, police station, court of law, prison, or large industrial organization in the country, but which has daily to cope with psychiatric problems.

[1] These figures, kindly furnished by Dr. C. B. Davenport, are from records of examination of 2,753,922 recruits.

PART II

SPECIAL PSYCHIATRY

CLASSIFICATION

SIXTEEN years ago, when the first French edition of this MANUAL was published, the author felt it incumbent on himself to offer a sort of apology for following Kraepelin's classification of mental disorders. Since then this classification has supplanted all others throughout the world, so that to-day an apology seems no longer necessary. We have, however, changed the arrangement of the clinical groups, placing them in an order as far as possible according to etiology.

I. CONSTITUTIONAL DISORDERS:

Arrests of development.
Epilepsy.
Constitutional psychopathic states.
Dementia præcox.
Paranoia.
Manic-depressive psychoses.
Involutional melancholia.
Psychoneuroses.
Huntington's chorea.

II. Alcoholic disorders:

Pathological drunkenness.
Delirium tremens.
Acute hallucinosis.
Alcoholic delusional states.
The polyneuritic psychosis.
Alcoholic dementia.

III. Drug addictions:

Opium, morphine, heroin, cocaine.

IV. Syphilitic disorders:

Cerebral syphilis.
General paralysis.
Cerebral arteriosclerosis.

V. Traumatic disorders:

Traumatic delirium.
Traumatic constitution.
Traumatic epilepsy.
Traumatic dementia.

VI. Miscellaneous groups:

Infective, exhaustive, autotoxic, thyrogenic, organic, and senile psychoses.

To secure uniformity in clinical work and published reports of all institutions in the United States and Canada the American Medico-Psychological Association adopted in May, 1917, a classification of mental diseases with the recommendation that all members introduce it in their respective hospitals. This classification has already been made the official one in many states and it is important for every psychiatrist to familiarize himself with it thoroughly. We have therefore reprinted it in Appendix VIII together with definitions and explanatory notes prepared by Dr. George H. Kirby, a member of the committee on statistics.

CHAPTER I

ARRESTS OF DEVELOPMENT: IDIOCY, IMBECILITY, MORONISM, BORDERLINE CONDITIONS.

Etiology.—*Bad heredity* is by far the most common and important cause of arrests of development. There are, however, other factors acting during intra-uterine life or in infancy or early childhood which may cause them; two of these deserve special mention, parental alcoholism and parental syphilis.

Alcoholism in all its forms is encountered in the parents of idiots and imbeciles: chronic alcoholism, drunkenness at the moment of conception or during pregnancy, etc. Statistics compiled by Bourneville show that 48% of idiots and imbeciles are the offspring of alcoholic parents.

These figures correspond approximately to those published by most other authors. Yet the question of the effect of parental alcoholism upon the offspring cannot be said to have been fully answered. The fact that a large percentage of the parents of defective children are alcoholic lacks significance in view of the great general prevalence of alcoholism and in the absence of accurate data concerning the frequency of alcoholism in the parents of normal children. Further, there is much evidence which suggests that alcoholism is often but a symptom of neuropathic constitution, so that abnormal traits in the offspring of alcoholic parents may possibly be attributable to inheritance of the neuropathic taint rather than to the injurious effect of alcohol upon the germ plasm. Unfortunately statistics bearing upon this important subject have not always been very critically examined.

In a recent memoir from the Francis Galton Laboratory for National Eugenics, University of London,[1] consisting in a statistical research of this subject, we find, among others, the following conclusions:

"There is a higher death rate among the offspring of alcoholic than among the offspring of sober parents.

"Owing to the greater fertility of alcoholic parents, the net family of the sober is hardly larger than the net family of the alcoholic.

"The general health of the children of alcoholic parents appears on the whole slightly better than that of the children of sober parents. There are fewer delicate children and in a most marked way cases of tuberculosis and epilepsy are less frequent than among the children of sober parents.

"Parental alcoholism is not the source of mental defect in offspring.

"The relationship, if any, between parental alcoholism and filial intelligence is so slight, that even its sign cannot be determined from the present material."

Inherited syphilis may act in two ways: either by giving rise to a congenital anomaly through intra-uterine disorders or by causing the appearance of meningeal and cerebral lesions during the first years of life of which arrest of development is the consequence.[2]

First Manifestations.—According to Sollier, who has made an extensive study of these anomalies, the principal early manifestations are:

(*a*) Difficulty in taking the breast; it seems each time that the act is a new one to the child;

(*b*) Violent, continued, and unprovoked crying;

(*c*) Impossibility of fixing the child's gaze;

(*d*) Lack of expression in the physiognomy.

Later on, at the age when intelligence becomes manifest in normal children, the signs of psychic insufficiency become

[1] Ethel M. Elderton and Karl Pearson. *A First Study of the Influence of Parental Alcoholism on the Physique and Ability of the Offspring.* London, 1910.

[2] F. Plaut. *The Wassermann Sero-Diagnosis of Syphilis in its Application to Psychiatry.* (English translation by Jelliffe and Casamajor.) New York, 1911.

more and more evident. The child is sad, surly, or, on the contrary, extraordinarily noisy and turbulent. It does not speak or it may be able to say only a few words at an age when other children already dispose of quite a vocabulary. More important than the language of transmission is that of reception. The chief characteristic of the congenital imbecile is the restricted number of words, not which he can pronounce, but *which he can understand.*

Physically arrest of development manifests itself most commonly in delayed walking and delayed acquisition of sphincter control. The so-called anatomical stigmata of degeneration are often seen, the most significant being the cranial deformities—microcephaly, macrocephaly, scaphocephaly, extreme brachy- or dolichocephaly.

Symptoms.—As with the growth of the child the psychic functions become of greater importance, their insufficiency becomes more apparent and manifests itself in the impossibility of the subject's deriving the usual benefit from education. There is delay in learning to talk and later unusual difficulty and slowness in learning to read and write.

School age is eventually outgrown with but poor educational achievement, if any, and the patient, now almost grown up, is apt to begin to show all sorts of social maladjustments: sex immorality, vagrancy, criminal tendency, dependency, etc.

The mental defect varies in degree in different cases, and these variations constitute the basis of the generally adopted classification into four principal groups: (1) *Idiocy.* (2) *Imbecility.* (3) *Moronism* or *Feeble-Mindedness.* (4) *Borderline Conditions.*

These groups may be variously defined. In cases of adults a degree of general intelligence corresponding to that of an average child not over three years of age, as determined by mental measurement, characterizes idiocy; between three and seven years, imbecility; between seven and eleven years, moronism; and between eleven and twelve years, borderline conditions.

In many respects it is preferable to use as a measure the "intelligence quotient" (often expressed by the symbol IQ) instead of the mental age.[1] According to this measure degrees of intelligence, both normal and abnormal, have been classified as follows:[2]

TABLE 13.

IQ	Classification
Above 140	"Near" genius or genius.
120–140	Very superior intelligence.
110–120	Superior intelligence
90–110	Normal, or average, intelligence.
80– 90	Dullness, rarely classifiable as feeble-mindedness.
70– 80	Borderline deficiency, sometimes classifiable as dullness, often as feeble-mindedness.
50– 70	Moronism.
20– 50	Imbecility.
Below 20	Idiocy.

Very practical definitions, from a sociological standpoint, have been formulated by the British Royal Commission on the Care and Control of the Feeble-Minded:

Idiots are persons so deeply defective in mind from birth or from an early age that they are unable to guard themselves from common physical dangers, such as, in the case of young children, would prevent their parents from leaving them alone.

Imbeciles are persons who are capable of guarding themselves from common physical dangers, but who are incapable of earning their own living by reason of mental defects existing from birth or from an early age.

Feeble-minded are persons who may be capable of earning a living under favorable circumstances, but are incapable from mental defect existing from birth or from an early age: (*a*) of competing on equal terms with their normal fellows; or (*b*) of managing themselves and their affairs with ordinary prudence.

While it is possible to measure quite precisely the degree of defect in cases of arrest of development, it is hardly pos-

[1] The "intelligence quotient" is the ratio of mental age to chronological age. It is used particularly in connection with the Stanford revision of the Binet-Simon intelligence scale.

[2] Lewis M. Terman. *The Measurement of Intelligence.* Boston, 1916.

sible in the present state of our knowledge to define exactly the nature of it. Perhaps most clearness on the subject is to be gained from Binet's conception of intelligence, which emphasizes three characteristics of the thought process: (1) Its tendency to take and maintain a definite direction; (2) the capacity to make adaptations for the purpose of attaining a desired end; and (3) the power of auto-criticism.[1]

As an illustration may be taken one of Binet's series of tests, that of arranging five weights, which is normally passed at the age of nine years:

"Success depends, in the first place, upon the correct comprehension of the task and the setting of a goal to be attained; secondly, upon the choice of a suitable method for realizing the goal; and finally, upon the ability to keep the end clearly in consciousness until all the steps necessary for its attainment have been gone through. Elementary as are the processes involved, they represent the prototype of all purposeful behavior. The statesman, the lawyer, the teacher, the physician, the carpenter, all in their own way and with their own materials, are continually engaged in setting goals, choosing means, and inhibiting the multitudinous appeals of irrelevant and distracting ideas. In this experiment the subject may fail in any one of the three requirements of the test or in all of them. (1) He may not comprehend the instructions and so be unable to set the goal. (2) Though understanding what is expected of him, he may adopt an absurd method of carrying out the task. Or (3) he may lose sight of the end and begin to play with the blocks, stacking them on top of one another, building trains, tossing them about, etc.

"However, an examination of the scale will show that the choice of tests was not guided entirely by any single formula as to the nature of intelligence. Binet's approach was a many-sided one. The scale includes tests of time orientation, of three or four kinds of memory, of apperception, of language comprehension, of knowledge about common objects, of free association, of number mastery, of constructive imagination, and of ability to compare concepts, to see contradictions, to combine fragments into a unitary whole, to comprehend abstract terms, and to meet novel situations."[2]

[1] Binet and Simon. *L'intelligence des imbeciles.* L'Année Psychologique, 1919.—Lewis M. Terman. *Loc. cit.*

[2] Lewis M. Terman. *Loc. cit.*

Usually both normal and defective subjects furnish more or less scattered results upon application of intelligence scales, i.e., they pass in some tests at higher age levels and fail in others at lower ones; and clinicians have often reported cases of arrest of development in which normal or even phenomenal mental capacity was observed in certain limited directions—memory, calculating ability, musical ability, etc. It would seem from all this that the nature of the defect is not the same in all cases of arrest of development, but is merely sufficiently pronounced and sufficiently general, in respect to the mental faculties involved, to seriously interfere with the patient's power of adjustment to ordinary conditions of life.

The defect of intelligence in cases of idiocy and imbecility is generally alone sufficient to produce serious social maladjustment. But in many cases of moronism and borderline conditions it is not the defect of intelligence, but some accompanying temperamental abnormality that is the main source of trouble. Many a moron of a mental age of, say, nine or ten years, being of pleasant disposition, industrious, and obedient, leads an uneventful existence as a useful member of the community, while many another, presenting no greater defect of intelligence, but being indolent or vicious, becomes a problem for the public authorities through dependency, vagrancy, prostitution, incendiarism, or other antisocial behavior.

Complications.—The most common *physical* complications are *epilepsy* and more or less marked residuals of *infantile cerebral paralysis.*

In some cases the epilepsy, in the course of years, produces mental deterioration, and the imbecile or moron becomes, in addition, an epileptic dement.

Among *mental* complications are to be noted *acute or subacute episodes* which appear in various clinical forms: maniacal excitement, depression, sometimes delusions more or less imperfectly systematized. Often the mental disorders appear as exaggerations of a constitutional anomaly,

essentially a function of the patient's make-up. An individual habitually touchy and suspicious develops persecutory delusions, another habitually psychasthenic suffers an attack of depression, etc. Such episodes in imbecility are incontestable clinical realities, and nothing is more justifiable than, for instance, a diagnosis of maniacal excitement in an imbecile. Unfortunately it is very difficult to assign for such episodes a place in psychiatric nosography. Do they constitute mental disorders peculiar to imbecility? Are they not, on the contrary, periodic psychoses to which the imbecility merely imparts special features: mobility of the symptoms, childish character of the delusional conceptions? For our part we are rather inclined toward the second hypothesis. In fact a full series of transition cases leads from classical manic-depressive psychoses to the more typical attacks in imbeciles. Moreover, such attacks in imbeciles present the same tendencies toward recovery and toward recurrency. It must be noted, however, that the influence of external causes, psychic as well as physical, in bringing about recurrencies, appears to be more marked in imbeciles than in manic-depressive persons who are not defective. It is also to be noted that the effect of suggestion upon the mental symptoms is surely more pronounced in the psychoses of imbeciles than in ordinary types of recurrent psychoses, so that psychic treatment is here found to be more efficacious.

Diagnosis.—In the diagnosis of arrests of development certain precautions and certain practical requirements should be borne in mind.

It should not be made on incomplete evidence. Illiteracy, or gross ignorance, or dependency, or low social status ("a common laborer all his life," "of the domestic servant class") may arouse suspicion of mental defectiveness but would not suffice to establish it, being often largely accounted for by environmental conditions. Similarly, a poor showing in psychological tests would not suffice for a diagnosis, but might lead to mistaking temporary psychotic disability or

acquired mental deterioration for original defect. The diagnosis must be based on a complete psychiatric investigation following some such scheme as that outlined in Chapters V and VI, Part I, of this MANUAL, and including family history, personal history, history of present disorder, physical examination, mental examination, and such special diagnostic procedures as may be indicated.

The diagnosis being established, it is necessary for practical purposes to determine the degree and nature of the mental defect. In the management of a given case it is obvious that much will depend on whether it is one of totally helpless idiocy; or low, medium, or high grade imbecility; or low, medium, or high grade moronism; or borderline intelligence with possibly considerable general educability or good capacity in some limited directions. The application of psychological measurements is here of great assistance. Similarly, it is important to determine whether the patient's difficulties are attributable mainly or largely to defect of intelligence or to unruliness, eroticism, lack of emotional control, criminal tendency, or other temperamental anomaly. The social history or several weeks of direct observation should be helpful in clearing up these questions.

Prognosis.—In cases of arrest of development no recovery is, of course, to be looked for; but much can be accomplished in a practical way, as the student may judge from the following discussion of treatment.

Treatment.—The general measures of treatment are: (*a*) Training and education. (*b*) Segregation. (*c*) Boarding out and employment under supervision.

(*a*) The training and education may be carried out either in special ungraded classes in public schools or in institutions for the feeble-minded, depending on tendencies or degree of manageableness of the given case, home conditions, etc. The aim is mainly to train the patient to dress and undress, to be of cleanly habits, to behave decorously, to read and write and know something of numbers, to tell

time by the clock, to keep track of days of the week and month, and to do some useful work.

"It is safe to say that over 50% of the adults of the higher grade who have been under training from childhood are capable, under intelligent supervision, of doing a sufficient amount of work to pay for the actual cost of their support, whether in an institution or at home." [1]

(*b*) Permanent segregation is necessary for idiots, imbeciles, defective delinquents, and feeble-minded women of child-bearing age.

"This lower class of idiots, many of them with untidy, disgusting, and disagreeable habits, feeble physically, perhaps deformed and misshapen, often partially paralyzed or subject to epilepsy, cannot be given suitable care at home. There is no greater burden possible in a home or in a neighborhood. It has been well said that by institutional care, for every five idiots cared for we restore four productive persons to the community; for, whereas at home the care of each of these children practically requires the time and energies of one person, in an institution the proportion of paid employees is not over one to each five inmates."

"Requiring permanent care are also the moral imbeciles and the adults of both sexes who have graduated from the school department, or are past school age, but cannot safely be trusted, either for their own good or the good of the community, where not under strict and judicious surveillance.

"The brighter classes of the feeble-minded, with their weak will power and deficient judgment, are easily influenced for evil and are prone to become vagrants, drunkards, and thieves." "As a matter of mere economy, it is now believed that it is better and cheaper for the community to assume the permanent custody of such persons before they have carried out a long career of expensive crime."

"The tendency to lead dissolute lives is especially noticeable in the females. A feeble-minded girl is exposed as no other girl in the world is exposed. She has not sense enough to protect herself from the perils to which women are subjected. Often sunny in disposition and physically attractive, they either marry and bring forth in geometrical ratio a new generation of defectives and dependents, or become irresponsible sources of corruption and debauchery in the communities where they live. There is hardly a poorhouse in this land where there are not two or more feeble-minded women with from one to four illegitimate

[1] Walter E. Fernald. *The Growth of Provision for the Feeble-Minded in the United States.* Mental Hygiene, Jan., 1917.

children each. There is every reason in morality, humanity, and public policy that these feeble-minded women should be under permanent and watchful guardianship, especially during the child-bearing age. A feeble-minded girl of the higher grade was accepted in the Massachusetts School for the Feeble-Minded when she was fifteen years of age. At the last moment the mother refused to send her to the school, as she 'could not bear the disgrace of publicly admitting that she had a feeble-minded child.' Ten years later the girl was committed to the institution by the court, after she had given birth to six illegitimate children, four of whom were still living and all feeble-minded. The city where she lived had supported her at the almshouse for a period of several months at each confinement, had been compelled to assume the burden of the life-long support of her progeny, and finally decided to place her in permanent custody." [1]

A good deal of segregation can be accomplished in colonies maintained by the parent institutions at distances of from 20 to 50 miles:

"During the past decade this form of care has rapidly grown, so that now there is general approval of the formation of colonies for adult male feeble-minded persons in good physical condition. Such colonies, when connected with 'parent' institutions, can be made self-supporting and seem to offer a most hopeful means of providing for a greatly increased number of cases at a minimum expense to the state." [2]

(*c*) The success of institutional training and discipline is such that many patients can eventually return to their homes or be boarded out and employed in the communities.

"The next step, it seems to me, in state care for mental defectives will be the development of plans for the supervised care of suitable cases, usually those who have had a period of institutional observation and training, in the communities. Many such patients can get on in their homes, while others may be 'boarded-out' in carefully selected families in rural communities, subject of course to strict supervision by officers of the parent institution." [3]

[1] Walter E. Fernald. *Loc. cit.*

[2] Walter E. Fernald. *Loc. cit.*

[3] Walter E. Fernald. *Loc. cit.*—See also C. Bernstein. *Self-Sustaining Feeble-Minded.* Ungraded, Nov., 1917.

CHAPTER II

PSYCHIC DISORDERS ASSOCIATED WITH EPILEPSY

FROM a psychiatric standpoint epilepsy manifests itself by *permanent disorders* and by *paroxysmal accidents.*

Permanent Psychic Disorders.—These impart to the epileptic personality a peculiar stamp and often lead one to surmise the existence of the disease before knowledge of any seizures is had. We shall consider separately *anomalies of disposition* and *intellectual disorders.*

(A) *Anomalies of Disposition.*—These are often very marked. The following are the principal ones:

(1) Irritability and variability of moods, selfishness, duplicity.

(2) Habitual apathy, sudden impulsive reactions, violent and at times terrible fits of anger.

(3) Lack of consistency between the patient's conduct and his ideas, more rarely abnormal stubbornness and tenacity: "Some celebrated men who are supposed to have been epileptics are more noted for their pertinacity than for the greatness of their conceptions."[1]

(4) Morbid religious fanaticism, not constant, but frequent, usually merely ostentatious, with more regard for the rites, ceremonies, and customs, and without influence upon the morality of the patient.

(B) *Intellectual Disorders.*—Epileptics are sometimes, but not often, as claimed by some authors, men of great intelligence. Some hold prominent places in history, in literature, and in the arts: such were Cæsar, Napoleon, Flaubert, and others. Others, though in a more modest

[1] Féré. *Les épilepsies et les épileptiques,* p. 423.

sphere, are honorable occupants of offices requiring lucid intelligence and sane judgment. These cases are, however, exceptional. Intellectual inferiority as a rule forms a part of the clinical picture of epilepsy. Often it is *congenital*, for most epileptics are originally feeble-minded; in other cases it is acquired; the manifestations of epilepsy—convulsions, fainting spells, psychic attacks—exercise a harmful and lasting influence upon the intelligence. When sufficiently marked, the mental deterioration becomes *epileptic dementia*.

The degree of dementia depends in a measure upon the number and severity of the seizures. "It cannot be doubted that the stupor produced by the major attacks is more marked than that resulting from minor ones; and it is certain, as is admitted by Legrand du Saulle, Voisin, Sommer, etc., that major seizures occurring at frequent intervals much more rapidly lead to dementia than do incomplete seizures." [1]

The two essential features of epileptic dementia are: (1) its irregularly *progressive* development, with aggravations following the seizures; (2) its being to a certain extent *remittent*, the apparent deterioration becoming less marked as the intervals between attacks become longer.

Paroxysmal Psychic Disorders.—These are either associated with, or replace, the epileptic seizures. We shall review briefly their principal forms.

(A) *Sensory and Psychic Auras.*—The first consist in hallucinations or illusions; the second "usually consist in a recollection of either a pleasant or an unpleasant character; perhaps a recollection of some person or of some important event in the patient's life." [2]

(B) *Unconsciousness Accompanying the Convulsive Phenomena:* though most frequently complete, it is sometimes but partial, so that there may be:

(*a*) *Vertigo*, which is a dazzling sensation rather than true vertigo,[3] and which is sometimes, but not always,

[1] Féré. *Loc. cit.*, p. 227. [2] Magnan. *Loc. cit.*, p. 6.
[3] Féré. *Loc. cit.*, p. 136.

accompanied by falling and slight convulsive movements. Together with pallor of the face, these phenomena constitute a rudimentary epileptic seizure.

(*b*) *Absence*, essentially characterized by a momentary suspension of all psychic operations. The patient suddenly becomes immobile, his gaze fixed, his expression vacant; the attack having passed, he resumes his work or conversation at the point where he left off. In some cases the patient continues automatically through the attack the work or the movement in which he happens to be engaged. A barber mentioned by Besson thus continued during his absences to shave his clients, performing his work just as skillfully as in the normal state.

Exceptionally the *absence* is prolonged for hours, days or even weeks. Féré rightly includes with these absences those peculiar states of obscuration which are known as *epileptic automatism*, during which the patient may execute complicated acts, such as taking a journey somewhere, stopping in hotels, etc., without retaining any recollection of them after the attack. Legrand du Saulle has reported a curious example of such automatism: an individual who was at Havre when his attack began, found himself on the way to Bombay when he regained consciousness, totally ignorant as to where he was or how he came there.

These states resemble states of somnambulism, with which they may, in fact, coexist.

(C) *Stupor Following the Seizures:* This is a constant phenomenon which constitutes in doubtful cases an important element of diagnosis (Samt). It varies in duration from several minutes to as many hours.

(D) *Delirium:* This is the gravest manifestation of epilepsy. Sometimes it accompanies a convulsive seizure; at other times it precedes or follows it; still at other times it takes the place of a seizure.

It begins with an accentuation of the disorders of the emotions and of the character. The patient becomes irritable, anxious, and the delirium establishes itself very

rapidly, often within several minutes, and never taking more than a few hours for its development.

The fundamental features in the classical form are:

(α) Profound *clouding of consciousness,* with complete *disorientation* of time and place;

(β) *Anxiety* which is sometimes terrible; in some cases it gives rise to violent agitation;

(γ) Numerous *hallucinations,* combined so as to constitute complete scenes, associated with delusions of a painful nature;

(δ) *Purely automatic* and extraordinarily violent *reactions;* the extreme limit of this violence is known as *epileptic furor.* In this condition the patient often commits crimes of revolting brutality bearing the stamp of absolute unconsciousness. He kills indiscriminately strangers or his own children, riddles the corpse with thrusts of his knife, cuts off pieces and devours them. In some cases, which are rare but very important from the medico-legal point of view, the criminal act appears to be prompted by the usual sentiments of the patient.[1] *Suicide* is sometimes observed;

(ϵ) *Amnesia,* which is usually absolute, following the attack. All classical descriptions show that the patients are as a rule totally ignorant of the damage or of the crimes which they have committed. This rule, however, has some exceptions. The patient may have a recollection, most frequently very vague, of the acts accomplished by him during the attack. Three classes of cases may present themselves: (1) the subject may retain a complete or partial recollection of the delirious period, which persists as an ordinary impression; (2) the recollection, present immediately after the attack, may be subsequently effaced, and the patient may deny facts which he previously admitted to be true; (3) inversely, the recollection, absent at the time when the patient comes to, may appear later on: the patient admits a fact which he previously denied. The recollec-

[1] Féré. *Loc. cit.,* p. 144.

tions of epileptic delirium are thus similar to those of ordinary dreams. We may forget within a few hours a dream which we remembered very clearly at the time of awakening or, more rarely, we may, on the contrary, recollect a dream which previously seemed to have left no impression whatever upon the mind.

Following is an abstract from the record of a case of epileptic delirium:

Louis M., forty-two years old, cab driver. Father alcoholic. Patient has had epilepsy from infancy. Has typical epileptic convulsions, though not frequent, almost exclusively nocturnal, occurring about once a month. Absences of long duration: one day the patient found himself driving his carriage about eight miles from the place where he wanted to go, not knowing how he came there.

February 17, 1901, toward six o'clock in the evening, following a violent dispute with a neighbor, the patient came home sad, depressed, and told his wife that he would throw himself into the river rather than live in such a disagreeable place. He went to bed without any supper and fell asleep. About nine o'clock he stood up in his bed, seeming to be in great fear and emitting inarticulate cries, then ran with nothing on but his shirt into the next room, seized a hatchet, and came back into the bedroom, where he began to hack away at everything within his reach. His wife, terrified, ran out and called for help. Some of the neighbors came but no one dared to enter the bedroom. In the meantime they could hear the strokes of the hatchet and the cracking of the furniture. In a few minutes the patient went at the door of the room, kicking it with his feet as though trying to break it down but making no attempt to open it. Finally three men climbed into the room through the window without the patient hearing them. They approached him from behind, disarmed and overpowered him, and while he defended himself violently and tried to bite them, they succeeded by the greatest efforts in getting him down and tying him to his bed. The patient struggled violently to free himself, but preserved complete mutism all the time and did not seem to recognize anyone. His respiration was panting, skin covered with perspiration, pupils widely dilated.

Toward five o'clock in the morning consciousness appeared to be returning. The patient began to look around him, noticed with astonishment the straps with which he was tied, and said a few words: "Take this off from me. . . . What is the matter with all these people? . . ." At about six o'clock he fell into a deep sleep and woke up at noon, tired but lucid. He had some recollection of the

beginning of the attack. He said he had had an impression that someone came into the room after him and his wife; it was then that he uttered the cries and ran to get the hatchet. After that he could remember nothing up to the time that he found himself tied in his bed. But what he saw even then he remembered but vaguely: he could not tell who were the people whom he had seen around his bed and said he believed that he had not recognized them at the time. Finally when shown the damage which he had done (the furniture in the room was partly destroyed), he was stupefied and could hardly believe that he was the cause of all the destruction.

An attack of epileptic delirium lasts from a few minutes to several days. It may be reduced to *a single automatic act*. Like the other manifestations of epilepsy, it may be produced always by the same external influence and assume the same form each time. This is of course far from being always the case.

The *termination* of the delirium is either sudden, following a profound sleep, or gradual, leaving for several hours delusions and hallucinations which persist in spite of the return of lucidity.

The above is a description of the most common, one may say classical, form of epileptic delirium. Another form is occasionally met with in which *ideas of grandeur* occur in place of the painful delusions; these ideas often assume a mystic character and are associated with a state of *euphoria* which may reach the intensity of ecstasy.

The *diagnosis* is very easy when these phenomena appear in an old epileptic; it becomes very difficult, however, when the epilepsy is "masked, or atypical in its course." [1]

There is no pathognomonic sign of epileptic delirium excepting, perhaps, the *stupor* which follows it and the importance of which is justly insisted upon by Samt and Moeli.[2] However, this stupor may be so slight as to escape the observation of those witnessing the attack. The previous history of the patient may contain nothing to aid in the diagnosis because delirium sometimes constitutes the

[1] Magnan. *Loc. cit.*, p. 2.

[2] Allg. Zeitsch. f. Psychiat., 1900, Nos. 2 and 3.

first manifestation of epilepsy. *Only upon the entire symptom complex together with the previous history of the patient can the diagnosis of epileptic delirium or of any other epileptic manifestation be established.*

We may distinguish:

Delirium tremens by the occupation delirium, intact autopsychic orientation, and history and physical signs of chronic alcoholism.

Delirious attacks of general paralysis, which may resemble epileptic delirium, by the clinical history, the special physical signs of this affection, and findings in the cerebro-spinal fluid.

Attacks of catatonic excitement by the relative conservation of lucidity.

Finally, in epilepsy one may meet with attacks of so-called *epileptic mania* which at times simulate closely the *manic-depressive psychoses*. However, in these attacks flight of ideas is much less pronounced, as a rule, and the morbid ideas are much more firmly fixed and much more monotonous.[1]

Several authors, Krafft-Ebing among them, have described under the name of *transitory delirium*, or *transitory mania*, very brief, non-recurring delirious attacks which they consider as a distinct morbid entity. The similarity between these attacks and those of epileptic delirium is such that most psychiatrists consider them as being of epileptic origin, at least in the great majority of cases. This opinion is held notably by Schwartz,[2] Régis,[3] and Vallon.[4] According to these authors the cases of transitory delirium which are not of epileptic origin are attributable to some infectious disease, alcoholism, etc. In the clinic only a close study of the antecedents of a given case enables one to decide to which of these causes the attack is due.

[1] Heilbronner. *Ueber epileptische Manie nebst Bemerkungen über Ideenflucht.* Monatsch. f. Psychiat. u. Neurol., 1902, Nos. 3 and 4.

[2] Schwartz. *Mania transitoria.* Allg. Zeits. f. Psychiat., 1891.

[3] Régis. *Manuel de maladies mentales.*

[4] Vallon. *Rapport au Congrés d'Angers,* 1898.

Treatment.—Some cases of epilepsy, suffering but infrequently from seizures—perhaps only at night—and being free from psychic disability, can and do, with the aid of occasional medical advice, lead normal lives.

For the bulk of cases, however, some provision of control and management is required. The treatment of these cases will be discussed briefly under the following captions: (1) Prevention. (2) Education and training. (3) Social service. (4) Hygienic measures. (5) Medication. (6) Treatment of special manifestations.

(1) *Prevention.*—This is eminently a problem in eugenics, the factor of heredity being the all important one in the etiology.[1] The segregation of epileptics in institutions is a practice which is rapidly growing in the United States, so that the outlook for the future is exceedingly encouraging. The National Committee for Mental Hygiene reports in its second annual census of the insane, feeble-minded, epileptics and inebriates in institutions in this country that on January 1, 1918, there were 11,944 epileptics in public and private institutions. This is undoubtedly an understatement, as "No attempt was made to secure data from almshouses, penal or reformatory institutions."[2] Some states maintain special institutions for epileptics, which would seem to be the best plan. Others provide for their care and treatment in institutions for the insane or feeble-minded.

(2) *Education and Training.*—For some cases of epilepsy this presents no special problems. But many others, being complicated with various degrees of mental defectiveness, require special provision such as has already been discussed in the chapter on Arrests of Development.

(3) *Social Service.*—Epileptics often go into occupations which are dangerous to them or for which they are not suited;

[1] C. B. Davenport and D. F. Weeks. *A First Study of Inheritance in Epilepsy.* Bulletin No. 4, Eugenics Record Office, Cold Spring Harbor, N. Y.

[2] H. M. Pollock and E. M. Furbush. *Annual Census of the Insane, Feeble-minded, Epileptics, and Inebriates in Institutions in the United States, January 1, 1918.* Mental Hygiene, Jan., 1919.

more often they lose their jobs when, owing to seizures while at work, their malady is discovered. They can be greatly benefited through social service by being placed in suitable employment under conditions of full understanding with employers concerning their trouble.[1]

(4) *Hygienic Measures.*—These consist mainly in special diet, abstinence from alcohol, and outdoor life with moderate physical and mental labor. It has been shown by dietetic experiments [2] that epileptics have a special intolerance for proteid material in any form, and that when their diet contains more proteid than the minimum required by the organism their convulsions are more frequent and more severe and their mental condition is worse than when their diet contains no such excess. The principal dietetic indication is, therefore, to reduce the amount of proteid to the minimum required by the organism.

(5) *Medication.*—Of all the drugs used in the treatment of epilepsy we shall mention only the bromides of the alkali metals and luminal.

The bromides of sodium and potassium are administered either separately or in a mixture of the two with bromide of ammonium, which mixture is sometimes known as the "tribromide." The doses vary according to age, frequency of attacks, and tolerance of the patient. The maximum that may be administered to an adult with benefit seems to be from 8 to 10 grams daily. Usually good results can be obtained from moderate doses—from 3 to 6 grams daily.

The action of the bromides seems to be more pronounced when the patient is allowed a "hypochlorization" diet; that is to say, a diet in which the amount of sodium chloride is reduced as far as possible (Richet and Toulouse).[3]

[1] Margherita Ryther and Mabel Ordway. *Economic Efficiency of Epileptic Patients.* Journ. of Nerv. and Mental Disease, May, 1918.

[2] Merson. *On the Diet in Epilepsy.* The West Riding Lunatic Asylum Medical Report, 1875.—Rosanoff. *The Diet in Epilepsy.* Journ. of Nerv. and Mental Disease, Dec., 1905, and Dec., 1909.

[3] Capeletti and Ormea. *Le régime achloruré dans le traitement bromuré de l'épilepsie.* Rev. de Psychiat., Apr., 1902.

The prevailing opinion among neurologists is against the routine administration of bromides in epilepsy. The principal indication for their administration would seem to be frequent and severe seizures with progressive deterioration. The course of medication should be interrupted by periods of a month or two of suspension of medication.

Luminal in doses of 1½ grains at bedtime has been highly recommended of late by Dercum and others. "In a number of instances the use of luminal as here indicated has resulted in the abolition of the convulsive seizures for periods extending not only over many months, but even over several years."[1]

(6) *Treatment of Special Manifestations.*—Excitement, such as occurs in epileptic delirium, has to be treated by methods already outlined in Chapter VIII, Part I, of this MANUAL.

Status epilepticus, i.e., continuous repetition of seizures without interval of consciousness lasting a day or longer and often terminating in death, must be promptly combated with an enema of soapsuds followed by

Chloral hydrate	1 gram
Potassium bromide	2 grams
Water	120 c.c.

per high rectal injection given slowly. A similar injection should be given again at the end of an hour if necessary. If at the end of two hours after the second injection the seizures still continue, ether inhalations may be given cautiously so as to avoid producing inhalation pneumonia. Hypodermic stimulation with strychnine or caffeine may be given in case of threatened collapse from exhaustion. As long as the condition lasts rectal feeding is to be preferred.

[1] F. X. Dercum. *On the Complete Control of Epileptic Seizures by Luminal.* Therapeutic Gazette, Sept. 15, 1919.

CHAPTER III

CONSTITUTIONAL PSYCHOPATHIC STATES

There is a large group of persons who, though not necessarily suffering from epileptic, psychotic, or psychoneurotic symptoms, alcoholic or drug addiction, or feeblemindedness in the strict sense of the term, are nevertheless incapable of attaining a satisfactory adjustment to the average environment of civilized society. This group is very heterogeneous, yet there is much evidence, in family and personal histories and in clinical manifestations, to show that the various conditions comprised in it are in some way related to one another and to other neuropathic conditions.

The maladjustment in these cases seems to arise on a basis of inherent anomalies of judgment, temperament, character, moral sense, or sexual make-up. It need hardly be added that both the underlying defect of personality and the social maladjustment vary in degree and that, moreover, not all social maladjustment rests upon constitutional abnormality of the individual.

Whatever the basic anomaly may be in a given case, it is apt to become manifest in childhood or early youth, but becomes greatly accentuated with emancipation from parental control and the assumption of the entire burden of social adjustment and responsibility. Thereupon, sooner or later, the individual comes to the attention of the police, courts of law, health officers, charitable organizations, or other public authorities as criminal, prostitute, vagrant, sanitary menace, or dependent.

In some cases, of a milder sort, more or less satisfactory adjustment is achieved and maintained until a situation arises

imposing special stress or new exactions; then the margin of safety is wiped out, and the individual, previously regarded as fairly normal, is found to be not altogether dependable. Thus many, who in ordinary times are able to make ends meet, become objects of charity when overtaken by illness or confronted with unemployment in hard times. Thus also a previously faithful and trusted bank clerk, discouraged by failure to gain advancement and goaded by poverty, yields to temptation and becomes involved in an embezzlement. And thus, again, the World War, with its acid test of demand for great personal sacrifice, suddenly brought to light a " yellow streak " in some men previously thought to be like the rest.

The prevalence of such conditions may be judged from the statistics of the National Army in the World War, which show that of all recruits, mainly between the ages of twenty-one and thirty-one, the local examining boards and the medical officers in training camps rejected 0.55 per 1000 for constitutional psychopathic states. Some more subsequently came to light in men who had been accepted for service.

Not infrequently, though, as already stated, by no means constantly or necessarily, constitutional psychopathic states are combined or complicated with mental deficiency, epileptic, psychotic, or psychoneurotic episodes, alcohol or drug addiction, etc.

The following varieties of constitutional psychopathic states have been distinguished in the classification adopted by the Surgeon General of the Army. It will be understood, of course, that most cases represent combinations of two or more of the various traits distinguished in the classification. (1) Inadequate personality. (2) Paranoid personality. (3) Emotional instability. (4) Criminalism. (5) Pathological lying. (6) Sexual psychopathy. (7) Nomadism. Following are brief descriptions of these several varieties.

Inadequate Personality.—These cases, either from lack of initiative, ambition, perseverance, or judgment; or through shiftlessness or tactlessness; or a planless, improvi-

dent existence, and often in spite of good educational, social, and economic opportunities, make an egregious failure of everything they attempt. The following case is a good example:

W. S., male, aged 44, born in Nassau County, N. Y., both parents being American and belonging to old Long Island families. " Off and on I worked for my brother H., in the hacking business, driving a hack; there was no money in it for me; just worked as long as I got enough to eat and a place to sleep; had also a good many other jobs; worked for about a year for a clothing firm in the city; also was in the plumbing business, steamfitting business, glazing, painting, anything that came along; then went in the brass business; then went into the calcium-light business for a theatre; also the well-driving business. The calcium-light business might have turned out pretty good, but a lot of kikes got into it and beat me out of it. I was married in the fall of 1896, at the age of 24. I had been in the well-driving business all summer; they paid $2.50 a day; but the job lasted only until a week before marriage, and after that I didn't have anything to do for a year." Q. What did you live on? A. " Sympathy, and what little I had." Later he got a job on the Long Island Railroad, but eventually gave it up. Q. Why did you give up that job? A. " Too much work. I asked for another man to help me; they wouldn't give me one; so I took a vacation and never went back; I had no intention of going back; life is too short and sweet. After that I didn't do much of anything; was baying two summers, doing any old thing that came along during the winter."

Local charitable organization reports: " He has five children ranging from twenty years to fifteen months in age; is known all over town for his laziness; is well and strong, mentally bright, but, on slight provocation, will give up a job gotten for him; often refuses work, demanding three or four dollars a day; at times simply says, ' I will not work.' Lets his wife and son work for the family; wife washes and oldest boy works on ice wagon; has received aid from town, church charities, and private individuals, mainly for his children."

Social worker's description of him is as follows: " Goes about with thick growth of hair on face; will not shave for weeks at a time; will not take a bath or change his clothes; leaves shirts on until they shine with grease; shoes unlaced; when seen by me had one shoe partly tied with a white string, the other unlaced with tongue of shoe dragging along the ground."

When questioned concerning the things that have been reported about him, said: " I have received charity ever since I can remember; suits of clothes, and so on; that's only a case of good fellowship. As

for the family having received support from the charities, it was only through their own will; and as far as my wife and son working to support the household, that's a misstatement. Of course, when I wasn't doing anything she would take in some washes to assist; but as for making a business of it, that's not true. I admire a woman who would do a thing like that; that is, more for the benefit of the children and that's all. About the lazy part, I can't tell you anything about it; naturally, I suppose, we are lazy, more or less." [1]

Paranoid Personality.—To understand this condition, one needs but to make a study of paranoia, from which it differs but in degree.[2] Conceit and suspicion, which are the fundamental traits of paranoia, here, too, lie at the root of all maladjustment; only here they do not lead so far as to produce a delusional system, as they do in paranoia. One sees, however, the same stubborn adherence to a fixed idea, contempt for the opinions of others, bias of judgment leading to distortion of practical values, argumentativeness, and tendency to develop persecutory trends.

Not a few such cases were seen in the National Army in the World War as so-called *conscientious objectors.* One draftee was opposed to killing " even a mosquito," lived on vegetable diet, and would not serve even in a non-combatant branch of the army, as thus he would be giving his active support to the " general purpose of killing." Another, a third-rate sculptor with a predilection for a bizarre, symbolic art, let his hair grow long, wore only bedroom slippers everywhere and in all kinds of weather, and would not put on a soldier's uniform and obey the law of conscription for the reason that " being an artist, and art being constructive, I could take no part in war, which is destructive." Some negroes were seen, who, though formerly " wicked," had recently become " converted " and, as " Christians," could not go to fight their fellow men.

A considerable group was made up of " International

[1] A. J. Rosanoff. *Survey of Mental Disorders in Nassau County, N. Y.* Report published by The National Committee for Mental Hygiene, New York, 1917.

[2] See Chapter V, Part II, this MANUAL.

Bible Students " or " Russellites." One of these wrote a fifty-page explanation, concluding it with the following remarks:

" No doubt these words will seem kind of foolish to you, because the Bible says that men with earthey idears and ambitions cannot understand speritual things. So I hope that you can see that I am not trying to save my own skin, by evadeing the military service, as I have explained, that I have seen through the Bible, where we people are all born in sin, and cannot do anything perfect, and that this war is only to bring around the conditions that will make the people look to God for everything later. And I have been trying to live up to God's laws, and am running for the high prize, and hope to make it, probably in the spring of 1918. As this year (1918) Text of the International Bible Students' Association is 1 Peter 4:7 and 8. The end of all things is at hand: be ye therefore sober and watch unto prayer, and above all things have fervent love among yourselves. I believe I have written enough to explain my proof—against participating in war, however if not enough why I have plenty more."

Emotional Instability.—Often the dominant note in the character of the psychopath is extreme mobility of the emotions. The subject passes alternately from exuberant joy to boundless desolation, from feverish activity to profound discouragement, from affection to hatred, from the most complete egoism to the most exaggerated generosity and devotion.

A special type of emotionally unstable psychopaths is found among impulsive criminals. They fly readily into uncontrollable rage and commit violent assaults. Punishment seems to have no deterrent effect. These subjects are given not only to repetitions of crimes of violence upon release from imprisonment, but, even while serving sentence where there can be no chance of escaping consequences, they yield to their impulses, assault other prisoners or keepers, and lose their chance of release for which they long so impatiently.

Criminalism.—By reason of its complexity the moral sense is one of the most delicate and most vulnerable functions of the mind. Thus we find it altered in most of the psychoses, especially those accompanied by mental deterioration.

There is, however, a condition, which has been variously termed moral insanity, moral imbecility, and inborn criminalism, and in which defect of moral sense exists more or less independently of feeble-mindedness, psychotic disease, or mental deterioration.

This condition finds early expression in perversities of character and conduct. The child is naughty, cruel, deceitful, irritable, violent; or he is, on the contrary, taciturn and dissembling.

Education totally fails to modify such natures. The moral sense is not built upon notions acquired through intellectual culture. It is the result of a special sensibility, of a function which the psychic organ lacks in these cases. "When this apparatus is absent, the most favorable surroundings fail to exercise their influence."[1]

As the child becomes a man, as he comes into more direct contact with society, his infirmity becomes more manifest. The dominant feature is seen to be profound egoism combined with complete indifference with regard to right and wrong.

The exclusive aim of such an individual is his pleasure or his own interest (and very often he has but poor judgment as regards even his own interest), and to reach this aim he does not hesitate to use any means or any expedient. He has neither sentiment of honor nor respect for the truth. His unique preoccupation is to escape conviction and punishment.

Cruel and malicious toward his inferiors and toward the weak in general, he is cowardly toward anybody who is above him. In the asylum or prison he quite readily submits to the rules and to the discipline and does not abandon himself to his morbid propensities until he regains his liberty.

Undoubtedly there are cases of moral defectiveness with a sane judgment and a strong will. These, freed from the

[1] E. Bleuler. *Der geborene Verbrecher*. 1896.—B. Glueck. *A Study of* 608 *Admissions to Sing Sing Prison*. Mental Hygiene, Jan., 1918.

scruples which might interfere with their liberty of action, occasionally have a brilliant career.

Almost always, however, other psychic anomalies are present in addition to the disorders of the moral sphere. The most frequent are:

(*a*) *Weakness of judgment:* the subject realizes but imperfectly the possible consequences of his acts, and in spite of all his precautions he ultimately comes into conflict with the law. The thoughtlessness of criminals is well known.

(*b*) *Absence of perseverance:* this prevents the utilization of any aptitudes which the patient may possess and which are in some instances very considerable.

(*c*) *Impulsiveness:* moral defectives readily yield to the first impulse, so that it is difficult in practice to distinguish them from the impulsive criminals. The best criterion is the existence of subsequent *remorse* in the latter. Unfortunately, it is impossible to determine its true degree of sincerity. It is well known with what consummate art hardened criminals simulate the most touching remorse.

(*d*) Diverse other psychic anomalies: *obsessions, morbid emotionalism,* etc.

Pathological Lying.—This consists in "falsification entirely disproportionate to any discernible end in view, engaged in by a person who, at the time of observation, cannot definitely be declared insane, feeble-minded, or epileptic. Such lying rarely, if ever, centers about a single event; although exhibited in very occasional cases for a short time, it manifests itself most frequently by far over a period of years, or even a lifetime. It represents a trait rather than an episode. Extensive, very complicated fabrications may be evolved. This has led to the synonyms: mythomania; pseudologia phantastica." [1]

The following case is reported by Healy:

Janet B., nineteen years old, made her way alone to New York,

[1] W. and M. T. Healy. *Pathological Lying, Accusation, and Swindling.* Boston, 1917

and there readily obtained employment. After a couple of weeks she approached a department manager of the concern for which she worked and related a long story, which at once aroused his sympathy. She told him that her father and mother had died in the last year and that she was entirely dependent upon herself. When she was about four years of age she had been in a terrible accident and a certain man had saved her life. Naturally her father had always thought very highly of this person and had pensioned him. Formerly he lived up in the country with his family, but at present was old, penniless, and alone in the city. Now that her parents were dead she was in a quandary about keeping up her father's obligation to the old man. Out of her $8 a week it was hard to make both ends meet. She had to pay her own board and for this man also. She found that he needed to be taken care of in every way; she had to wash his face and dress him, he was so helpless. She made no demand for any increase of salary and the story was told evidently without any specific intent. The services of a social worker were enlisted by the firm and the girl reiterated the same story to her, even though it was clearly intended that the case should be investigated. Janet's boarding-house was visited and there she was found to be living with distant relatives whom she had searched out upon her arrival in the city. They knew she had run away from home, and indeed by this time the mother herself was already in New York, having been sent for by them.

She then acknowledged that this story of a man who had saved her life was purely an invention. Now she stated that in the western town where she lived she had been engaged to a young man who was discovered to be a defaulter and who had recently died. When this fellow was in trouble, his mother, while calling on Janet's family, used to make signals to her and leave notes under the table cover, asking for funds with which to help him out. This was a great strain upon Janet and even more so was his death. She could stand it no longer and fled the city. Her lover's stealing was a secret which she had kept from her own family.

Before we had become acquainted with the true facts about the family this girl gave us most extensive accounts of various phases of her home life which included the most unlikely and contradictory details. For instance, they had a large house with beautiful grounds, yet before she left home she bought a sewing machine for her mother, which she is paying for on weekly installments. Her $8 a week is very little for her to live on because she is paying this indebtedness. Janet wishes now to take out a twenty-year endowment policy in favor of her mother. She expects to take up French and Spanish in the evenings because they would be very helpful to her commercially. She has no desire for social affairs. She is only desirous of improving her education. She relates her success as a Sunday School teacher.

The most notable finding was Janet's facial expression when confronted by some of her incongruities of behavior. Then she assumed a most peculiar, open-eyed, wondering, dumb expression. When flatly told a certain part of her story was falsehood, she looked one straight in the eyes and said in a wonderfully demure and semi-sorrowful manner, "I am sorry you think so." Her expression was sincere enough to make even experienced observers half think they must themselves be wrong.

The story of this girl's falsifications and fabrications as obtained from her people is exceedingly long. Somewhere about twelve years of age, her parents cannot be certain just when, they noticed she began the exaggeration and lying which has continued more or less ever since.

The type of Janet's lying has been not only in the form of falsifications about matters which directly concerned herself, but also involved extensive manufacture of long stories, phantasies. Meeting people she might give them extensive accounts of the wealth and importance of her own family. She once spread the report that her sister was married and living in a fine home close by, giving many elaborate details of the new household. Such stories naturally caused much family embarrassment. Then she worked up an imaginary entertainment and gave invitations to her brothers and sister at the request of a pretended hostess. Just before the event she, simulating the hostess, telephoned that an accident had taken place and the party would not be given. An extremely delicate situation arose because she alleged a certain young man wanted to marry her. The truth of her assertion in this matter never was investigated. The parents felt it quite impossible to go to the young man about the facts on account of the danger of exposing their daughter. They were long embarrassed by the extent to which she kept this affair going, but it finally was dropped without any social scandal occurring. In this and other affairs the family situation was at times unbearable because of the possibility that there might be some truth underlying the girls' statement. As the years went on Janet, of course, suffered from her loss of reputation, but still continued her practices of lying.

Sexual Psychopathy.[1]—Among the anomalies of sexual life it is usual to distinguish:

(A) Anomalies of degree: eroticism; frigidity.

(B) Anomalies of nature: sexual perversion; sexual inversion.

(A) *Anomalies of Degree.—Eroticism* results in venereal excesses and often in indecent acts and attempts of rape.

[1] R. v. Krafft-Ebing. *Psychopathia Sexualis.*

Sexual frigidity consists in an indifference and even an aversion of the subject to sexual connection; at least to normal sexual connection, for frigidity may be associated with sexual perversion or inversion. A curious and apparently paradoxical fact is its frequency among prostitutes.

(B) *Anomalies of Nature.*—(*a*) *Sexual perversion* consists in the abnormal character of the conditions necessary to excite sexual desire and sometimes its gratification. Its most common forms are *masturbation*, *fetichism*, *exhibitionism*, *sadism*, *masochism*, *bestiality* and *necrophilia*.

Masturbation is very frequent in psychopaths. Often appearing very early it is to be regarded as a sign and not as a cause of the abnormality, though in all probability it accentuates already existing defects.

Fetichism occurs almost exclusively in men; it is an anomaly in which sexual excitement and sometimes even gratification, accompanied by ejaculation, are produced by the sight or contact of certain objects, or of certain parts of the female body other than the genital organs.

Fetiches may be (α) various objects: articles of clothing (gowns, petticoats, handkerchiefs), toilet articles, laces, expensive fabrics, in a word, all objects used by women; (β) parts of the body: the breasts, the hands, the feet, the hair. Several fetiches may be associated in the mind of the same patient.

Moll has justly remarked that the mere fact that an individual has a predilection for some portion of the female body does not in itself constitute fetichism. "One may like by preference a pretty mouth, light or dark hair, or large eyes, without having any genital perversion." Similarly a letter or an object belonging to a woman may produce an agreeable impression by the recollections which it arouses. An anomaly is present only when the presence or mental representation of such objects is in itself sufficient and provokes sexual excitement without giving rise to recollection of any particular woman.

Fetichism often appears at the time when normally the

sexual instinct becomes manifest. The choice of the fetich depends upon the impression which is accidentally associated with the first genital excitement. While in the normal individual this accidental association leaves no trace, in the fetichist the impression and the excitation form an indissoluble combination, so that the first invariably brings about the second.

The desire to possess the fetich is sometimes so intense as to lead the patient to thefts or to various strange acts. One patient of Vallon's was arrested while cutting bits of cloth from the dresses of women who were with him at the time in a newspaper office. Most of the so-called hair despoilers are hair fetichists.

Exhibitionism may be met with in dements and epileptics, and often takes the form of an impulsive obsession.

Sadism consists in a sense of voluptuousness derived from suffering which the patient witnesses or inflicts upon his victim. This sense is almost always associated with a state of genital excitation. As is the case with most sexual anomalies, it is more frequent in men.

History contains terrible examples of sadism. Such is that of Marshal Gilles de Rays, who, during a period of eight years, assassinated over eight hundred children,[1] subjecting them previously to defilement and torture.

Sadism is exercised chiefly upon women and children; more rarely upon animals.

Many sadists content themselves with simulation of suffering or with fictitious humiliation inflicted upon their pseudo-victim. The sadism is then *symbolic* (Krafft-Ebing).

Masochism, unlike sadism, is more frequent in women. It consists in an abnormal pleasure which the subject derives from his or her own suffering or humiliation. To this category belong the individuals who request women to strike and insult them and in whom sexual excitation cannot be produced otherwise.

Bestiality consists in an impulse to copulate with animals.

[1] Quoted by Krafft-Ebing from Jacob, the historian.

Like all genital impulses it often assumes the shape of an imperative idea which the subject can in some cases resist by an effort of the will or by various curious subterfuges. Magnan cites a case of a young girl who, seized with the idea of having connection with a dog, escaped the morbid impulse by turning her attention to another animal.

Necrophilia is the rarest of all forms of sexual perversion. It consists in a particular pleasure which the subject experiences from the sight or contact of a cadaver. Often, but not always, this is accompanied by an impulse to defile the corpse.

(*b*) *Sexual inversion* consists in a contrast existing between the *physical sex* and the *psychic sex:* the subject presents the sexual tendencies of the opposite sex.

Much more frequent in men than in women, sexual inversion often, but not always, leads to pederasty. Sexual inversion is congenital. The anomaly is stamped upon the entire psychic and even physical personality of the subject.

Many of these individuals have the character and tastes of the opposite sex. The little boy plays with dolls and finds pleasure only in the society of girls. Later on the same feminine tendencies persist, and the patient secretly abandons himself to them. We also often meet with men, apparently normal, who in their privacy dress themselves in female attire, cover themselves with laces, or passionately indulge in feminine employments, as sewing, embroidery, etc.

Physically certain anomalies are noted which resemble the normal characteristics of the feminine organism: considerable development of the breasts and hips, absence of the beard, rounded shape of the neck, etc. Occasionally we observe a more or less marked degree of pseudo-hermaphroditism.

The opposite anomalies are encountered in the female sexual invert: masculine features, beard, masculine voice, etc.

Some inverts may have normal sexual intercourse,

but they derive no satisfaction from it, and always feel an attraction for the homologous sex; often they marry, hoping thus to cure their infirmity, but their attempt is never successful.

Nomadism.[1]—The nomadic tendency is present in most of us in some degree and, as all know, is in certain races so pronounced as to govern their mode of existence and social organization.[2] In persons in whom the wandering impulse is much stronger than the average it is still to be judged for practical purposes as being within normal limits, provided it has not the effect of breaking down social adjustment, but leads merely to special choice of occupation, as in many cases of explorers, sailors, railroad employees, travelling salesmen, etc.

Inhibition of the wandering impulse sometimes fails in cases of mental deficiency, epilepsy, dementia præcox, and manic-depressive psychoses. Such failure may be periodic, corresponding with psychotic attacks and resulting in nomadic episodes separated by normal intervals of months or years; or it may be permanent owing to chronicity of the underlying mental disorder.

There are, however, cases in which mental deficiency, epilepsy, psychotic disease, or mental deterioration cannot be demonstrated and in which, nevertheless, the nomadic impulse is in such degree imperative as to lead to a tramp existence and constant aimless wandering precluding all possibility of continued occupation. These are the cases included in the group of constitutional psychopathic states.

Such individuals travel on foot, in freight cars, as stowaways on steamers. They visit the most distant parts of the

[1] C. B. Davenport. *Nomadism, or the Wandering Impulse, with Special Reference to Heredity.* Washington, 1915.—R. Meunier. *Les vagabonds et la vagabondage.* Rev. mod. de med. et de chir., 1908.—A. Joffroy and R. Dupouy. *Fugues et Vagabondage.* Paris, 1909.—E. Stier. *Wandertrieb und pathologisches Fortlaufen bei Kindern.* Samml. zwangl. Abh. z. Neuro- und Psychopath. des Kindersalters. Vol. I, 1913.

[2] M. Gaster. *Gipsies.* Encyclopædia Britannica, 11th edition.

country or even of the world. They work only enough to keep themselves supplied with food to live on and clothes to cover them. Not infrequently they find themselves forced to beg, steal, or trespass on private property for a sheltered place to spend a night.

They seldom stay long in one place—perhaps not more than a few hours; yet, when about to leave, it matters little to them where they go, as long as they move. A tramp starting, say, from Chicago to go to Seattle, might readily change his plan upon invitation from another to accompany him to New Orleans, even if it were the case that he had just come from there.

Pathological nomads are seldom able to give a rational reason for their wanderings. Most frequently they say it is "to see something of the world." But in reality they hardly ever interest themselves, in the manner of tourists, in the noteworthy sights of the places they visit.

Although generally without education or culture, they are apt to acquire in their wanderings much detailed geographical information of a certain kind—distances, roads, train schedules, climatic conditions, local customs; and those whose wanderings extend to foreign countries acquire a smattering of many foreign languages.

CHAPTER IV

DEMENTIA PRÆCOX

UNDER the name hebephrenia, Hecker, inspired by his preceptor, Kahlbaum, described a psychosis which develops by predilection at the age of puberty and which terminates in a peculiar state of mental deterioration.

Later Kraepelin extended the views of Hecker and added to this group catatonia,[1] which had previously been considered an independent affection, and paranoid dementia, which included the majority of delusional states then commonly assigned to the vast and ill-defined group of paranoias. This fusion resulted in a new morbid entity: *dementia præcox.*

As we shall see later on, dementia præcox cannot be defined either by the age at which it occurs or by the rapidity with which it develops. Its specific element lies in the sum of the psychic changes, affecting the emotions, the will, and association of ideas. Generally these changes are permanent and constitute the mental deterioration which is the most common outcome of the disease. In some cases these changes may recede either temporarily or even permanently.

Dementia præcox appears in many forms that are difficult to classify. In Germany, fol owing Kraepelin, three principal forms are distinguished: hebephrenia, catatonia, and paranoid dementia. Delusional types of hebephrenia resemble paranoid dementia so closely that it is often impossible to determine to which of these groups a given case should be assigned. It seems more convenient for

[1] Kahlbaum. *Die Katatonie oder das Spannungsirresein,* 1894.

practical purposes to describe separately the following three forms: simple dementia præcox without delusions; dementia præcox of catatonic form; and dementia præcox of delusional form.

We shall study first the psychic and somatic symptoms that are common to all forms.

SYMPTOMS COMMON TO ALL FORMS

Psychic Symptoms.[1]—All psychic functions are not equally affected. While orientation and memory are often preserved or but little affected, attention, association of ideas, the emotions, and the reactions are always markedly involved.

Lucidity and Orientation.—These very frequently remain intact, although the appearance of the patients would scarcely lead one to think so. Many patients appear to be ignorant of what occurs about them, yet they will give rational and correct replies to questions concerning the date, their surroundings, and even the important events of the day. We shall return to this question in connection with the study of catatonia.

Memory.—Like lucidity, memory is but slightly affected, at least in the majority of cases for a considerable number of years. Old impressions remain well defined, and the knowledge acquired during youth and childhood is often astonishingly well preserved. An old asylum inmate, a typical case of dementia præcox, who had been in the institution for fifteen years, was still able to name without hesitation and in their proper succession all the French rulers from the time of Clovis.

Actual occurrences impress themselves quite durably upon the memory. Many patients are able to relate events that have taken place since their commitment, and can often even name the physicians and attendants who have followed each other on the service during several years.

[1] Masselon. *Psychologie des déments précoces.* Thèse de Paris, 1902.

However, when the affection is of long standing it is rare for the memory not to have become impaired to some extent. Anterograde amnesia is the first to appear; the power of fixation becomes diminished. Retrograde amnesia appears later and is usually less marked. Little by little old impressions grow fainter and may even become entirely effaced.

Attention.—This faculty is always weakened. Any labor requiring some degree of concentration becomes impossible.

Association of Ideas.—These are sluggish and often occur without any apparent connection, giving rise to speech which may reach the extreme limits of *incoherence.* We have given an example of such speech.[1] These incoherent phrases are uttered quietly and without the volubility which characterizes flight of ideas of the maniac. On superficial examination this phenomenon may create the impression of a profound state of dementia or mental confusion, which in reality does not exist. The patient whose incoherent speech we have quoted as an example is perfectly oriented and possesses good memory.

The *affectivity* and the *reactions* are greatly impaired from the beginning. *Indifference* constitutes an early and very prominent symptom of dementia præcox. The patient takes no interest in anything, expresses no desires, makes no complaints. Often even hunger determines no reaction. If the patient is accidentally forgotten at meal time he evinces no surprise and makes no protest. As in all conditions of dementia, this disorder of affectivity is not a conscious one.

Occasionally, especially at the onset of the illness, this habitual state of indifference is interrupted by explosions of anxiety or of anger, for which there is often no apparent cause.

A priori the emotional indifference of dementia præcox would be expected to lead to a reduction of the voluntary and

[1] See page 51.

normal reactions. Observations upon patients show this, indeed, to be the case.

On the other hand, the automatic reactions are often exaggerated. They manifest themselves under all the forms described in Part I of this MANUAL: pathological suggestibility, negativism, impulsiveness (stereotypy of movements and of attitudes, verbigeration, grimaces, unprovoked laughter, etc.).

Mental Deterioration.—When, as is most often the case, the disorder of attention, the sluggish formation of associations of ideas, and the impairment of affectivity and of the will, or in other words, when all the symptoms which we have described above have become definitely established, we have *mental deterioration.*

The degree of deterioration is variable. In some cases it apparently affects the psychic functions to so pronounced a degree that all mental activity seems to have disappeared, and, from this point of view, the patient cannot be distinguished from an idiot or from an advanced general paralytic. Such cases are exceptional, and often enough the dementia is much less complete than it appears to be from a superficial examination, as is shown by the following case:

Theresa C., formerly a school teacher, at present (1905) a patient at the Clermont Asylum, aged thirty-four years. The disease came on at the age of twenty-five. For several years this patient has lived in a state of apparently complete unconsciousness, incapable of carrying out the simplest commands or answering the most elementary questions. The facial expression is silly. The patient spends most of her time sitting in a chair or wandering about the court-yard, talking incoherently, her utterances showing marked stereotypy. The word "mystery" keeps recurring in the manner of a *Leitmotiv*: "To digest the nature of mystery, Claude of mystery, Matthew of mystery, Joseph of mystery. It is a conflagration, it is a petticoat, it is an oblation, resurrection, when will you wake up like the brutes. Mystery, of mystery, forty-eight of mystery," etc. Totally indifferent to everything, she manifests not the slightest emotion when spoken to about her family, or when offered her release. She is filthy in her habits. And yet, when a pen is put in her hand she will write disconnected words or fragments of sentences *without a single orthographical error.* No

example could illustrate more clearly the dissociation which characterizes dementia præcox in which total ruin of some faculties is compatible with perfect conservation of knowledge acquired previously.

Somatic Disorders.[1]—These are present in all three forms of the disease, though they are perhaps most marked in the catatonic form.

Motility.—The disorders of motility consist in hemiplegias and monoplegias that are slight and of short duration; convulsive hysteriform or epileptiform seizures; and fainting spells. The contractures often observed are usually the consequence of negativism.

Sensibility.—One must be guarded against attributing the absence of reaction to pricking, which results from negativism, to anæthesia. True disorders of sensibility are, however, far from being exceptional. They are often unilateral, as in hysteria. Other hysteriform symptoms of the same order are also encountered: tender areas, clavus, globus hystericus, etc.

Tendon Reflexes.—Sometimes diminished or abolished, much more frequently exaggerated.

Pupils.—Their disorders are frequent but variable: inequality, mydriasis, sluggish reaction, the phenomenon of Pilcz, i.e., contraction of the pupils on forcible closure of the eyelids. This phenomenon is analogous to the following one, which was observed at the same time, independently, by Pilcz and by Westphal: "If the patient attempts to shut his eye while his effort is opposed by the examiner who holds the lids apart forcibly with the fingers, a contraction of the pupil takes place while the eyeball is rolled upward and outward." [2]

The pupillary disorders often undergo fluctuations corresponding to those of the mental condition. We recall a case of catatonia in which the intensity of the stupor deter-

[1] Sérieux et Masselon. *Les troubles physiques chez les déments précoces.* Soc. méd psych., June, 1902.

[2] Pilcz. *Revue neurologique,* 1900, No. 13.

mined, as it were, the degree of mydriasis. As the stupor disappeared the pupils reassumed their normal size.

Circulatory Apparatus.—Vasomotor disorders causing œdema, cyanosis of the extremities, and dermatographia are frequent. Sometimes the pulse is slowed.

The *temperature* may be subnormal (Kraepelin).[1]

Digestive Tract.—Indigestion, anorexia, and constipation are often found, especially during the acute period. The development of mental deterioration is occasionally marked by boulimia.

Urinary Apparatus.—Sometimes there is polyuria, at other times, on the contrary, oliguria. The changes in the composition of the urine are but little known. A diminution of urea and an increase of chlorides have been found.[2]

Secretions.—We know nothing of the disorders of the secretions excepting that of saliva, which in some cases is greatly increased.

General Nutrition.—Its changes, though undoubtedly of great importance, are as yet but little known. The weight is reduced in the acute stages, but rises again during the quiet periods. Some precocious dements present a remarkable degree of corpulence.

A. SIMPLE DEMENTIA PRÆCOX

In this form the symptoms are reduced to phenomena of mental deterioration together with more or less pronounced changes in disposition.

The *onset* is almost always insidious, and it is usually impossible to determine even approximately its date. A subject previously affectionate, active, intelligent, even brilliant, becomes indifferent, indolent, and distracted. He

[1] *Lehrbuch der Psychiatrie*, 7th edition, Vol. II, p. 190.

[2] Dide et Chénais. *Recherches urologiques et hématologiques dans la démence précoce.* Ann. méd. psych 1902.

is weary of everything, of play as well as work. He ceases to acquire new ideas, or to coördinate those which he has acquired previously, so that his general stock of ideas becomes more and more limited.

Nervous symptoms (headache, insomnia, hysteriform disturbances) or constitutional symptoms (anorexia, loss of flesh) are frequent.

In the mild forms the disease is often unrecognized. The symptoms of mental deterioration pass for "negligence" or "lack of ambition." Such cases occur much more frequently than is commonly known.

The following lines from a letter addressed by a principal of a school to the parents of one of his pupils are very significant from this point of view:

"As you can see, the marks of M L. are no better than those for the preceding term, far from it. This pupil pays no attention to his duties, which three-fourths of the time are left unfinished; he no longer takes the trouble of learning his lessons. In the class room and at his studies he spends most of his time dreaming. It is evident that he cares nothing for his work. His professors no longer recognize in him the former studious pupil. It seems that even the approaching examinations do not affect his indifference. When it is pointed out to him that he is likely to fail, he promises vaguely to be more diligent, but one can see that he has no firm determination. The comments and suggestions in the letters of his parents no longer have any effect on him. . . . Formerly so jolly and so full of good humor, he has become quite unsociable. He does not seem to be pleased except when alone. When, by way of exception, he joins his comrades in conversation or in play, he soon leaves them, often after quarreling with them over some absurd trifle. . . . Lately he has been complaining of insomnia and headache. We have had the physician see him, but he has found nothing serious and has merely prescribed rest."

M. L. is to-day a true dement. He lives with his parents and is at best able to do only simple manual work. For a long time he showed some irritability. Now he has become totally indifferent.

B. CATATONIA

Onset.—Prodromata are almost constant; they possess no specific features: change of disposition, inaptitude for work, insomnia.

Often the symptoms of *melancholia* open the series of grave phenomena. In themselves they present no pathognomonic features, but consist merely in a state of depression or psychic pain which may be associated with delusions and hallucinations.

Soon the catatonic phenomena proper appear; they may occur also at the onset without being preceded by the period of depression mentioned above. They depend upon a disorder of affectivity, *indifference*, and a disorder of the reactions, *disappearance of the normal will* associated with *exaggeration of the mental automatism*. Clinically they appear in two principal forms: *catatonic excitement* and *catatonic stupor*.

Catatonic Excitement.—Sometimes, especially at the beginning, it simulates an attack of confusional psychosis or of mania: disordered movements, incoherent speech, impulsive reactions. Soon, however, the nature of the symptoms becomes more definite and the peculiar characteristics of catatonic excitement appear. Its principal features are as follows:

(1) Catatonic excitement is free from any emotion;

(2) It is not influenced by external impressions;

(3) It is not, at least in the majority of cases, governed by definite delusions;

(4) It is monotonous (stereotyped movements, verbigeration).

In other words, the reactions in catatonic excitement attain the extreme limits of automatism.

The spells of excitement occur without cause, in an impulsive and unexpected manner. The patient performs most singular and at times most dangerous acts without being able to furnish any explanation for his conduct even

when the attack has passed and has left in his mind a clear recollection of all that he did. A catatonic, perfectly composed an instant before, leaves his bed, seizes a glass and throws it violently at the head of his neighbor. Another breaks to pieces a thermometer imprudently left in his possession. A third calls loudly for a drink of water while holding in his hand a glass filled to the brim. Some display for weeks or months suicidal tendencies without there being any depressive ideas to account for them.

The movements, attitudes, and conversation present stereotypy and verbigeration. Often the patients assume an affected or dramatic air. Their gestures, manners, and fantastic dress frequently survive the period of excitement and persist through the quiet periods and the terminal dementia. Some patients will hop on one foot for months instead of walking; others will invariably respond to all questions by the same phrase; still others will not eat their food without first mixing it up into a disgusting mess; others, again, will walk back and forth on a short path all day long, taking alternately a certain number of steps forward and the same number backward. Such examples could be multiplied indefinitely. Most frequently these peculiarities in the conduct of the patient are purely automatic and remain inexplicable. They are usually not dependent upon delusions. Their origin lies in a perversion of the reactions, and not in any disorder of ideation or of perception. Although delusions and hallucinations are not invariably absent in catatonia, as is insisted upon by Tschisch,[1] they are too rare to explain the anomalies of the reactions, which are constant.

Catatonic Stupor.—This may follow a period of depression or one of catatonic excitement, or it may be primary, constituting the onset of the disease.

In its true sense the term "stupor" implies the existence of a profound disorder of consciousness. In this

[1] Tschisch. *Die Katatanie.* A Russian work abstracted in *Allgem. Zeitschr. für Psychiatrie,* 1900.

connection, however, the word is used in a different sense. As a matter of fact lucidity is but slightly if at all impaired in the catatonic. Impressions of the external world are perceived almost normally. Very frequently the patient, though seemingly unconscious of his surroundings, relates, after the stuporous attack has passed, with surprising precision the facts which would seem to have totally escaped his observation.

In spite of appearances catatonic stupor is therefore not the result of an intellectual disorder proper, but, like catatonic excitement, of a disorder of the will.

Automatism of the reactions is met with in three forms, which we have already mentioned: negativism, stereotypy, and pathological suggestibility.

Negativism is manifested in simple acts, such as movements of a limb, as well as in complex acts, such as eating, dressing, etc. The patient fails to react to stimuli either from the external world or from his own organism.[1] An order given is not executed. Pricking, even when deep, produces no movement, not because it is not felt, but because voluntary reaction is annihilated. Hunger produces no reaction. The urine accumulates in the bladder, saliva in the mouth, fæcal matter in the rectum without there being any true paralysis.

Two particularly interesting forms of negativism are mutism and refusal of food. Either symptom may persist for a long time without interruption and each may present very diverse characteristics.

Stereotypy is seen in the attitudes and in the physiognomy.

Certain patients assume very singular positions: extreme flexion of the limbs, a squatting position, the elbows upon the knees, the head drawn back, etc.

The physiognomy of the patient is often distorted by grimaces. The lips are contorted in a kind of grin, or protruded, as though the patient were making faces. The

[1] Stoddart. *Anesthesia in the Insane.* The Journal of Mental Science, Oct., 1899.

eyes may be closed tightly. These phenomena may persist for months or years. Almost always, at least in the beginning, they disappear during sleep.

Pathological suggestibility often alternates with negativism. Certain catatonics retain any attitude in which they may be placed, even the most uncomfortable (cataleptoid attitudes). Incapable of making their toilet they submissively allow themselves to be washed, combed, and dressed. Many become filthy and soil and wet themselves unless taken to the toilet at regular intervals. Sometimes a single impulse suffices to start the subject and make him accomplish in a sort of mechanical manner some habitual act or even series of acts: once seated at the table with his plate filled in front of him, he may eat like a normal person.

Echolalia and echopraxia—phenomena which are also dependent upon suggestibility—are not infrequent.

Like catatonic excitement, catatonic stupor is essentially free from emotion.

The following case is a good illustration of catatonic excitement and catatonic stupor:

Adrienne P., patient at the St. Anne Asylum, corset maker, twenty-five years old at the onset of her illness.—*Heredity:* paternal grandfather died at the age of sixty years of senile dementia; father is an alcoholic, has been committed twice; paternal aunt committed suicide.—The patient began to walk and speak very late in childhood; menstruation appeared at the age of seventeen, has been regular but painful. She showed no abnormality in intelligence or disposition.—At nineteen, pleurisy. At twenty-four, during a sojourn in London, a severe attack of scarlet fever with pronounced albuminuria; patient was sick three and a half months; convalescence lasted two months. Since then (fall of 1897), the relatives noticed a change in the mental condition of the patient from the letters which she wrote home. On her return to France Adrienne was gloomy, irritable, apathetic. She refused to work and often even to rise in the morning. Complete loss of appetite, headache. Much worried about her health, she consulted several physicians but with no appreciable result.

On October 20, 1898, acute symptoms set in in the form of disorders of perception. The people are "droll," the dishes served in the restaurant are "droll," life is "droll" and "absurd." At the

same time hallucinations of vision appeared: the patient saw men following her, also ghosts and stars. On October 26 she started out to go to her sister who lived in the suburbs of Paris; failing to find her she walked at random and wandered around the country for two days and two nights. She was found walking along a railroad track, her hair undone, her clothes in disorder; they arrested her and took her to the Corbeil Hospital where she remained eight days in complete mutism. On her return to her mother her mutism disappeared, but she gave no explanation of what she did, telling simply that she had seen things which frightened her: terrible men and animals. For some time she remained relatively quiet, but depressed and intractable. She refused to see a physician, though her mother begged her to do so. On the night of November 24 she suddenly became greatly excited, cried, gesticulated, and uttered incoherent remarks some of which were suggestive of hallucinations: she spoke of men following her and of saints whom she saw. She tried to throw herself out of the window.

On being brought to the clinic on November 28 she was in almost complete mutism. To all questions put to her she responded by outlandish gestures and grimaces bearing no reference to the questions. On being asked to write she tore the piece of paper which was offered her.

On December 1, at the occasion of a visit from her mother, Adrienne came out of her mutism but her remarks were incoherent. "She cannot see, she can see very clearly. . It is Alfred, it is Martin speaking to her. . . . They are not saying anything." It was very difficult to tell whether she really had hallucinations.

Toward the evening she became totally estranged from the external world. She no longer responded to any question.

Spells of excitement and of stupor have since then followed each other without any regularity, presenting respectively the characteristic features of catatonic excitement and of catatonic stupor.

The excitement is purely automatic. The same movements are constantly repeated monotonously and aimlessly. For hours at a time the patient goes through peculiar and incomprehensible gestures, striking the floor alternately with the right foot and with the left foot, and extending her arms and clinching her fists in a threatening manner but never striking anyone. She stands up in her bed in a dramatic attitude, draped with the blanket, and frozen, so to speak, in that position, uncomfortable as it is. In her attacks of excitement she displays considerable physical strength. On May 25, 1900, she made a steady, persistent attempt to leave her bed and get out of the dormitory; her eyes were shut, her expression apathetic, and she uttered not a word or a cry. Several nurses held her back with difficulty.

Her utterances show either incoherence or verbigeration. On

January 15, 1900, she stood up in her bed and sang for several hours: "The baker's wife has money," etc. On May 23, of the same year, she kept repeating during several hours without interruption "Hail Mary," etc.

She shows marked negativism. When spoken to she will give no response, showing absolute mutism; she resists systematically all attempts at passive movement: to open her mouth, to flex an extended limb, or *vice versa*. The command to open her eyes results immediately in a spasm of the orbicularis muscle. Refusal of food is at times complete, and then the patient has to be tube-fed; at other times it is partial, the patient taking only liquid food which is poured into her mouth by means of a feeding cup and which she then swallows readily. On November 4, without any apparent reason, she ate spontaneously a piece of bread which she took from the table. For two days she thus took bread, cheese, and chocolate, but persistently refused everything else. Later she relapsed into the former state and now takes none but liquid food which has to be poured into her mouth. Her sensibility appears to be normal, but all reaction is annihilated. Painful pricking with a pin causes slight trembling, but no cry, nor any movement of defense.

In the stuporous phases the patient lies in her bed, completely immobile. Generally this immobility is dominated by negativism which is manifested by the same traits as those observed in her excited phases. On several occasions, however, she has shown very marked suggestibility. Thus once she submitted readily, though passively, to being dressed and taken to the office of the ward physician. When standing she remains motionless, yet she will walk mechanically as soon as she is pushed. When invited to sit down, the patient slightly flexes her legs and makes a movement as though starting to sit down, showing that the command is understood; yet she will go no further, but remains standing. When taken by the shoulder and slightly pushed she sits down without trouble. Her limbs are flaccid and present no resistance to any passive movement. Negativism persists only in the muscles of the mouth and eye-lids, which remain closed and resist being opened. Cataleptoid attitudes are rare. One was, however, observed on October 30, 1900. The right arm was held for ten minutes in complete extension. On the following day this symptom disappeared.

The patient soils and wets her bed frequently, though not constantly, both during the periods of excitement and during those of stupor.

The general nutrition is profoundly affected; the skin is discolored, the hair is falling out, and there is considerable emaciation: from December, 1898, until May, 1899, the patient's weight fell from 94 to 77 pounds.

In March, 1901, the patient, considered as being completely incurable, was transferred to another institution.

Save in the rare cases in which the disease terminates in recovery, the catatonic comes out of his spell of excitement or of stupor with more or less mental deterioration.

Often some of the catatonic phenomena persist, thus disclosing the origin of the dementia: stereotyped attitude, mannerisms, verbigeration, etc.

The following case illustrates this point:

Suzanne N., patient at the Clermont Asylum, at present (1904) fifty-eight years old. The disease came on in 1894, when the patient was forty-eight years old. The clinical record in this case shows an affection developing by alternating attacks of excitement and depression, with occasional mutism and refusal of food. For the past several years the patient has been living apparently estranged from all that surrounds her. She never speaks to the physician, to the nurses, or to any of the other patients. She answers no questions, carries out no command. Negativism is very marked. Any attempt to open her mouth, shake hands with her, etc., meets with absolute resistance. The patient's gestures, actions, and utterances present all the features of stereotypy. For hours she keeps repeating certain movements, which would surely very soon tire out a normal person, and which consist in shaking both hands up and down a good deal like little children do in imitation of marionettes. When free she starts immediately for the nearest door, which she tries to open, and, when she succeeds in doing so, continues to walk straight ahead without any aim. Yet if she is tied in her chair, even though it be only with nothing stronger than a woolen thread, she will not budge. When the door of the ward is shut she is completely mute—but the instant the door is opened, she begins mechanically, like a spring that is suddenly released, to repeat in a monotone: "Eucharist, penance, extreme unction," or "Jesus Christ, Holy Sacrament," or she recites from beginning to end: "I believe in God," etc. This is kept up as long as the door remains open, but ceases as soon as it is shut.

She is very untidy in her habits, spilling her food upon her dress and often wetting her bed or clothes.

In spite of the complete indifference which she shows, the patient is perfectly lucid. Nothing that occurs about her escapes her observation. During the visits of her relatives her mutism disappears as by magic. She converses readily and tells all the gossip of the institution: they had a feast on mid-Lent, Mrs. X. got a new dress, etc.

The disease often develops in repeated acute attacks, each, whatever be its form, leaving behind it a more advanced degree of mental deterioration. Occasionally attacks of excitement and stupor alternate with each other with a certain regularity, simulating a manic-depressive psychosis.

C. DEMENTIA PRÆCOX OF DELUSIONAL FORM

The *prodromata* consist, as in most psychoses, in change of disposition, insomnia, and impairment of general health.

Schematically we may distinguish in the delusional form of dementia præcox two extreme types which are connected by a great many intermediate types: (1) the incoherent type; (2) the systematized type.

(1) Dementia Præcox with Incoherent Delusions.—As this name indicates, the delusions and the numerous hallucinations which usually accompany them follow each other without any connection or governing idea, and are accepted by the patient as they appear, without any attempt on his part to find an explanation or interpretation for them.

The general character of the delusions may be of three varieties:

(*a*) *Depressive Variety:* Melancholy delusions associated with more or less marked depression and hallucinations of a painful nature. Often ideas of persecution are added to the melancholy ideas, and occasionally they even predominate. It is not rare to encounter, especially at the beginning of the disease, attacks of very pronounced anxiety, suicidal ideas and attempts, or violent tendencies.

(*b*) *Maniacal Variety:* Excitement, irritability, morbid euphoria, ideas of grandeur occasionally associated with ideas of persecution, numerous hallucinations, erotic tendencies, and sometimes a certain degree of confusion.

(*c*) *Mixed Variety:* The two preceding varieties are seldom met with in a state of purity. They are almost always combined with each other in one of two different ways:

(1) States of depression and those of excitement alternate without any order, and mutually replace each other every instant; in other words, the delusional state is *polymorphous.*

(2) The disease develops in three stages:

I. Depression with melancholy delusions;

II. Excitement with expansive delusions;

III. Dementia.

Sometimes, as in catatonia, the disease assumes a circular type. There are recurrent attacks, each consisting of a phase of depression and one of excitement and leaving behind each time a more pronounced state of deterioration.

(2) Dementia Præcox with Systematized Delusions.—This is the type to which the term *paranoid dementia* is most applicable. The systematization of the delusions is not equally accurate in all cases. Sometimes it is quite perfect, so that the disease resembles paranoia. In other cases the systematization is, on the contrary, so imperfect that one hesitates to classify the case as dementia præcox with systematized delusions. We have already seen that there exists between the two delusional forms of dementia præcox an infinity of intermediate forms.

Lucidity is preserved except during the transitory acute paroxysms, which are of frequent occurrence.

Hallucinations are frequent and affect all the senses.

Dementia supervenes after a variable period of time, which is in some cases very long. As it progresses the number of delusions becomes more and more limited, the hallucinations diminish in frequency and in intensity, and the reactions become weaker and weaker. Often the system of delusions is reduced to one or two morbid ideas, crystallized, so to speak, and constituting a *paranoic residue* which remains as the last vestige of the delusional state originally characterizing the affection. Neologisms are frequent in the period of dementia.

The systematized type of delusional dementia præcox is met with in three principal varieties:

(*a*) Persecutory variety;
(*b*) Melancholic variety;
(*c*) Megalomaniacal variety.

(*a*) *Persecutory Variety.*—The delusions may either appear rapidly, after a brief period of prodromata, or, on the contrary, they may develop slowly, accompanied at first by false interpretations and only later by hallucinations.

The *psycho-sensory disorders*, hallucinations and illusions, are constant, of an unpleasant nature, and may affect any of the senses. Hallucinations of the genital sense are frequent.

The *reactions* consist in defensive acts; these reactions become gradually weaker as the dementia becomes established.

The dementia is often announced by disaggregation of the personality, with such symptoms as autochthonous ideas, motor hallucinations, stealing and echo of the thoughts, etc. The time of its appearance is quite variable. Multiplicity of hallucinations usually indicates a grave prognosis and points to a rapid evolution toward mental deterioration.

It is not rare to note some degree of excitement appearing in paroxysmal attacks.

(*b*) *Melancholic Variety.*—At the onset the melancholy ideas present no peculiarity. There are ideas of culpability, humility, ruin, etc., as in involutional melancholia and manic-depressive psychoses. Later they group themselves so as to form a *delusional system* which persists until the appearance of dementia.

All varieties of psycho-sensory disturbances are met with. The most important are motor hallucinations, which are of quite frequent occurrence and indicate already advanced psychic disaggregation.

Mystic ideas, ideas of possession, hypochondriacal ideas, and ideas of negation are frequent.

Attacks of anxiety, common in the beginning, as they are in all psychoses in which the depressed state predomi-

nates, become less and less frequent as the peculiar indifference of dementia præcox establishes itself, and the most frightful delusions often exist without any emotional reaction.

As in the preceding form, the mental deterioration often takes a long time to develop.

(*c*) *Megalomaniacal Variety.*—The ideas of grandeur may either be primary or they may follow a very brief period of ideas of persecution. They assume the most varied forms. The patients claim to be owners of immense fortunes, to be of illustrious descent, to possess remarkable talents, etc.

The hallucinations, which are less numerous and less constant in this than in the two preceding varieties, are always of an agreeable nature. The development of dementia is usually rapid.

(*d*) *Mixed Varieties.*—The three preceding varieties may combine so as to form four principal mixed types:

Type I: Period of melancholia; period of persecutory ideas; period of dementia.

Type II: Period of melancholia; period of persecutory ideas; period of grandiose ideas; period of dementia.

Type III: Period of melancholia; period of grandiose ideas; period of dementia.

Type IV: Period of persecutory ideas; period of grandiose ideas; period of dementia.

The different periods almost always overlap; melancholy ideas and ideas of persecution, for instance, often coexist; and the same is true of ideas of grandeur and ideas of persecution.

We regret that the space at our disposal is so limited as to preclude citing cases illustrative of all the different varieties of paranoid dementia. We shall limit ourselves to the citation of one case which seems to have reached its complete development and which will give the student an idea of paranoid dementia with imperfectly systematized delusions terminating in mental deterioration.

Louise S., fifty years of age, occupation day worker. The disease

came on in 1882. The record of examination at that time shows a state of depression with ideas of persecution and numerous hallucinations. Toward 1886 systematized delusions of persecution had developed, also combined with hallucinations. From 1890 to 1892 the patient had spells of extreme excitement, caused, it seems, by auditory hallucinations; in her excited spells she made many violent assaults on those about her. Since 1894 the delusions lost their systematization.

At present the patient presents a rather incoherent delusional state, consisting of ideas of persecution, ideas of grandeur, hallucinations of hearing and of vision, and characterized by formation of numerous neologisms.

The patient's persecutors are two in number: a man and a woman. They sleep in the asylum at night. But they go out every morning and the patient sees them wandering about in the vicinity of the asylum (visual hallucinations). She sees them "in a by-place, like the trees in the distance." All that she knows about their dress is that the woman wears a black scarf with tricolored stripes at the ends: green and two shades of red. Their name is "Tantan." As they go by they shout "There are the Tantans! There are the Tantans!" Their remarks contain many neologisms. They complain of being "knaified" (tied together) by a cord which they call "credamina". When they see the peasants at work they say: "We shall 'charlott' (stroll around), that will be better." They pour out imprecations and threats against the "asilette" (sanatorium): "Nasty asilette! . . . We shall founder the asilette! . . . We shall open fire upon the asilette!" They try to poison the food of the patients, and this spoils the taste of the food and causes symptoms of poisoning. They call the patient "cracked" and threaten to kill her. But she is not afraid of them, as she has authority over them, provided the physicians will give her the power. On the thirteenth of last February she made them pay 502 francs which they owed her for washing. They are very deeply in debt; they owe especially a great deal of money to the town of Clermont and they are condemned to wander until they have paid off all their debts.

The patient's ideas of grandeur are much more incoherent than those of persecution. The patient has two existences. The duration of the first—which preceded her birth—is reckoned in centuries. The second, which is her "minority," is reckoned as forty-nine years (her real age). She has assumed a fictitious name: Mrs. Schlem, *née* Madeleine Vean Marcille. Each human being coming from the hands of God should, according to her, bear a "number of creation." Hers is 2511. Born in Alsace (which is correct), she was brought up in the land of "Frantz," a country like France, only "more ancient and more serious," governed at once "by a republic, a king, and an emperor." She spent part of her life in the

"Helvandese" republic. She made her living there by manufacturing desserts. Since then she became the successor of Her Majesty "Angerguma," the queen of the "Sgoths," a people living between Switzerland *S* and Switzerland *C*. She has 59 million francs which she earned by working as a nurse for children and later as a portress. Her wages were 3 francs per day. She was nurse for children for four hundred and seven years. The rest of the time—she cannot tell exactly the number of years—she has been working as portress, which is still her occupation. All her titles and all her rights are recorded in the "documents of conviction," a book which she has. Information concerning this book is to be obtained from the one in charge of the scullery.

These delusions, though active, at present produce no reaction on the part of the patient and do not affect her lucidity. The patient is quiet and is a useful and intelligent worker. She works in the dining room of her ward, sees that the table cloth is put on at the proper time and that the slices of bread are regularly distributed. After meals she helps to wash the dishes and watches over the work of her helpers. Between meals she works in the nurses' kitchen. On Sundays she writes letters for other patients who are unable to write. The letters which she composes are perfectly sensible, and the spelling is tolerably good, which indicates the conservation of a certain amount of knowledge acquired previously. But her activity is always in the same direction in which it has been for a number of years. The supervising nurse reports that she cannot adapt herself to new work.

Her affections have completely disappeared. Her children, whom she persists in calling her "babies," paid her a visit several years ago. She recognized them, but received them with absolute indifference. She shows no attachment to anyone about her. Whenever any nurse or patient leaves the institution, she simply says: "Another will soon come in her place."

Délire Chronique à Évolution Systématique.—Isolated by Magnan from the poorly defined group of paranoic conditions, *délire chronique* presents a striking analogy to certain forms of dementia præcox, which fact led Kraepelin to include it under the heading of paranoid dementia. Conforming to French usage, we shall describe it as a separate clinical entity, which appears to us to be justifiable, at least provisionally, in view of the following considerations:

(1) This condition appears at an age when dementia præcox is already rare—after thirty years in the majority of cases;

(2) The delusions present perfect systematization and a regular evolution, which is unusual in dementia præcox;

(3) The dementia does not appear for many years. Sometimes it does not appear at all, even when the patient has reached an advanced age (Falret).

The name "dementia præcox" would scarcely be applicable to an affection usually appearing at an adult age, and in which mental deterioration does not supervene until long after the onset—twenty years or more. Though we may consider this disorder as being very closely related to dementia præcox, it would seem that more facts are necessary to establish the identity of the two conditions.

The evolution of *délire chronique* occurs in four periods, which we shall consider hastily, for the symptoms encountered in each of these periods have already been described, and it is but the special grouping of these symptoms that imparts to this disease its characteristic aspect.

First Period: Incubation.—This period is always a prolonged one. The personality of the patient undergoes a slow and insensible, though profound, transformation. The symptoms observed at the beginning present no definite character. They consist of an *irritability* and a singular *pessimism,* with which are often associated *hypochondriacal ideas.*

Little by little these pathological phenomena become more and more marked and develop into ideas of persecution. Suspiciousness and uneasiness appear first, followed later by *delusional interpretations:* the patient imagines he is watched as he walks in the street, he discovers a hidden meaning in a conversation. Illusions of all the senses, but especially those of hearing and of smell, gradually appear as the affection reaches the second period.

Second Period: Systematization of the Delusions; Appearance of Hallucinations.—Hallucinations are constant and affect all the senses *except vision.* They are always of a painful character. The first to appear are *phonemes* (verbal auditory hallucinations), which, vague at the beginning,

assume after a certain time remarkable distinctness. They are followed by the appearance of hallucinations of taste, smell, general sensibility, including the genital sense, and, later on, motor hallucinations also.

Visual hallucinations are extremely rare, if ever present at all. On the other hand, illusions of sight are as frequent as those of the other senses, often taking the form of *mistakes of identity*.

By degrees the delusions group themselves and become systematized. The hallucinations are interpreted and explained. The patient recognizes the voices, discovers his persecutors, the methods they make use of, and the aims they pursue. As he is perfectly convinced of the reality of his delusions, he reacts, seeking to protect himself against his imaginary enemies and to find justice. The means to which he may resort are infinitely varied: protests before authorities and before the public, frequent changing of residence, and but too often assaults and murder.

As the disease advances, more and more evident signs of psychic disaggregation appear: echo of the thoughts, autochthonous ideas, motor hallucinations, etc.

Third Period: Ideas of Grandeur.—Some authors regard the ideas of grandeur as a logical sequence of those of persecution, resulting from the following line of reasoning, which the patient is assumed to pursue more or less consciously: "They persecute me so unmercifully and with such stubbornness because they are afraid of me or jealous of me." This explanation is perhaps applicable to a small number of cases, but not to all.

The real cause of the ideas of grandeur is the mental deterioration which makes its appearance at this period.

These ideas are of all possible forms: ideas of wealth, of power, or of transformation of the personality. One patient was God and his persecutor was the devil. Another reigned over the planet Mars, and once decided to destroy the earth by means of aeroliths.

Fourth Period: Dementia.—Mental deterioration here

becomes clearly apparent. Its character is very similar to, if not identical with, that of dementia præcox, and this is undoubtedly strong evidence of a close relationship between the two conditions.

Almost always some stereotyped delusions persist as a last remnant of the former system of delusions.

The *evolution* of the disease is very slow, often requiring twenty or thirty years for its completion.

The *prognosis* is fatal from the psychic standpoint. But the morbid process does not affect the organic functions, and the patients may live to an old age.

DIAGNOSIS, PROGNOSIS, ETIOLOGY, NATURE AND TREATMENT OF DEMENTIA PRÆCOX

Diagnosis.—This is based on:

(*a*) Early appearance of disorders of affectivity and of the reactions;

(*b*) Delayed appearance of intellectual disorders proper and their less marked intensity;

(*c*) The contrast existing in most cases between the delusions and the emotional tone;

(*d*) The purely automatic character of the excitement and of most of the reactions.

It is at the beginning that the greatest difficulty in diagnosis is experienced.

Mental confusion is to be distinguished by the much more pronounced disorientation, the much more *real* disorder, so to speak, of consciousness, and by the symptoms of profound denutrition, sometimes of true cachexia, which are a constant manifestation of the disease.

General paralysis is distinguished by the intellectual deterioration *en masse*, by its characteristic physical signs, and by its special etiology.

Delirium tremens, which may be simulated by the delirious outbreaks marking the onset of dementia præcox, is recognized by the pathognomonic character of the hallucinations.

by the very pronounced allopsychic disorientation contrasting with the intact autopsychic orientation, and by the history and physical signs of alcoholism.

Alcoholic hallucinosis is often very difficult to distinguish from the delusional form of dementia præcox. Special attention must be paid to the etiology of the case and to the evolution of the disease, which is more favorable in alcoholic hallucinosis. One should, however, be very guarded in rendering a diagnosis as well as a prognosis. In practice it is not rare to meet with chronic alcoholics who present after an attack of alcoholic hallucinosis or even of delirium tremens the symptoms of dementia præcox which subsequently run the classical course and to which the alcoholism has served merely as a portal of entry.

Prognosis.—This is always grave as the usual outcome is dementia.

The mental deterioration is sometimes so slight, it is true, that it appears only as a scarcely perceptible sluggishness of association of ideas, a certain degree of emotional indifference, and a tendency to intellectual fatigue.

A certain number of patients even form an exception to the general rule and recover completely. Such cases are rare and are to be accepted only with extreme circumspection. Many of the apparently complete recoveries are but relative, and many recoveries considered permanent are but temporary; that is to say, they are mere *remissions*.

Indeed, remissions are frequent in dementia præcox. Their duration varies within very wide limits, from a few hours to several years. It is not exceptional for a precocious dement to come out of his first attack apparently unscathed, resume his normal life for five, six, or more years, suffer a recurrency, and end with dementia.

Dementia præcox is not in itself a fatal disease. It may terminate fatally from some of its complications. The most formidable of these is pulmonary tuberculosis, which is apt to attack patients in a state of depression or in catatonic stupor.

Such is the general prognosis of dementia præcox. But since the possibility of recovery or at least of long remissions exists in some cases, the practical psychiatrist is in every case, considered individually, confronted with the problem of rendering not a general but a special prognosis.

It is difficult, not to say impossible, to predict the course and outcome of a given case. Some features of the disease have, however, been found empirically to be of special prognostic significance, and may therefore aid the physician in forming an opinion.

The first point, one that should never be lost sight of, is that only those cases can be properly regarded as absolutely incurable in which there is actual mental deterioration. In this connection the most certain and most constant sign of mental deterioration is *indifference*, when it exists independently of any marked disorder of consciousness, hallucinations, excitement, or stupor, in other words, when it exists as a basic disorder. A host of symptoms, descriptions of which have already been given and which need not here again be entered upon (weakening of attention, inaction, etc.), are seen in more or less close association with indifference; it must, however, be insisted on that their significance is subordinate to that of indifference.

Aside from these states of actual deterioration the prognosis should always be guarded. Nevertheless valuable indications may be gained from a study of the combination of symptoms before the development of mental deterioration; for the various forms in which the disease appears and, in the same form, the predominance of one or another symptom, afford very different indications.

There is but little to be said concerning the simple form: consisting essentially of mental deterioration, it may be regarded as incurable from the beginning. The question may arise whether the deterioration will progress or will remain stationary. Unfortunately there is no sign which might aid in forming a judgment on this point.

The catatonic form presents the greatest chance of

cure. Kraepelin has observed in 20% of his cases remissions so complete and so lasting as to resemble cures. Other psychiatrists the world over have reported similar results. It seems clear, therefore, that recovery from catatonia is a possible thing.

Catatonic symptoms are not all of the same gravity. In a general way, states of excitement are of lesser gravity than states of stupor, the latter not being, however, always incurable. Negativism, morbid suggestibility, or delusions do not imply a particularly unfavorable prognosis and are capable of retrogression and complete disappearance. On the other hand stereotypy, whether of speech, movements, or attitudes, very marked incoherence, sudden violent and unexplained impulses, not having their origin in a delusion or a hallucination, have an unfavorable significance and generally indicate chronicity, without, however, enabling us to predict the degree of mental deterioration to which the disease may lead. These symptoms would justify us in saying fairly definitely that the patient will not get well, but not that the disease will be arrested in its progress, or that it will advance; this point should always be reserved.

The delusional forms are not all of the same gravity, although on the whole the prognosis of delusional dementia præcox is more grave than that of catatonia. Systematization of the delusions is almost always a sign of chronicity. We say chronicity, but not tendency toward either rapid or profound mental deterioration; for there are types of paranoid dementia with active and well systematized delusions in which it would be very difficult to detect any trace of mental deterioration. Such cases approach those which are to-day still described under the name of *délire chronique* without dementia and which have been insisted on by Falret and his pupils, when they have maintained, contrary to Magnan, that the period of dementia may be wanting in that condition. Hence, the indication of systematized delusions is: chronicity very probable, but not necessarily dementia.

This probability becomes even greater when the delusional system becomes impoverished, begins to show features of incoherence and absurdity, and especially when the delusions cease to be accompanied by adequate affective state and reactions. The latter principle is but a corollary of the principle enunciated above, namely, that indifference without an obvious basis is a symptom of incurability.

As signs of unfavorable prognosis in paranoid dementia should be mentioned, further, multiplicity of hallucinations (when occurring independently of mental confusion), in particular psychomotor hallucinations and those of general sensibility, also transformation of the personality.

These are, briefly sketched, the data which enable us in a certain measure to foresee the course in a given case of dementia præcox. One must not be misled into taking the value of these criteria to be any greater than that of provisional landmarks; in the present state of our knowledge skill in prognosis is dependent chiefly upon appreciation of fine shades, which comes only with long experience in mental diseases.

As being of prognostic significance may be mentioned further very decided " shut-in " make-up (see p. 259) and insidious onset, both points being of grave import, while abrupt onset in a subject of normal mental make-up affords greater hope of improvement or recovery.

Etiology.—Statistics show that dementia præcox is a disease chiefly of young life. According to Kraepelin, in 60% of the cases it begins before the twenty-fifth year. It is rare after the age of thirty. It seems, however, difficult to state at what age it entirely ceases to occur. Certain psychoses identical with it in symptoms and evolution are met with at advanced ages.

Heredity is to be regarded as the essential cause of this disorder.[1]

[1] E. Rüdin. *Einige Wege und Ziele der Familienforschung, mit Rücksicht auf die Psychiatrie.* Zeitsch. f. d. gesamte Neurol. u. Psychiatrie, Nov., 1911.—A. J. Rosanoff and F. I. Orr. *A Study of Heredity*

Severe infections, overwork, grief, and traumatisms are occasionally found in the history of dementia præcox. (For a discussion of contributing causes see pp. 9–12.)

The nature of the disease has so far escaped us, and we must be content for the present with hypotheses.

According to some authors dementia præcox results from an arrest of mental development; the brain ceases to acquire new impressions, being exhausted by previous efforts which were too great for the energy which it originally possessed. This explanation, assuming it to be correct, can account for but a small number of cases. In reality, in most of the patients we observe not a stationary condition, but a true retrogression. Facts that have been acquired partly disappear, or at least cease to be coördinated so as to give rise to generalized ideas. Moreover, the disorders of affectivity and of the will cannot be accounted for by simple arrest of development.

According to Kraepelin's hypothesis dementia præcox is a disease of autointoxication. Many of the physical symptoms described above resemble the phenomena by which intoxications of exogenous or of endogenous origin are usually manifested: epileptiform attacks, disorders of the circulation and of the secretions, and alterations of the general nutrition.

Possibly the poison is the consequence of a disorder of secretion of the genital organs. The frequent appearance of the first symptoms at the age of puberty, or in the female at the time of her first childbirth, and the occasional development of the disease in interrupted stages, each corresponding to a period of pregnancy, are arguments in favor of this hypothesis.

A suggestive and far-reaching hypothesis bearing on the pathogenesis of dementia præcox has been advanced by Adolf Meyer.

in Insanity in the Light of the Mendelian Theory. Amer. Journ. of Insanity, Oct., 1911.—Ph. Jolly. *Die Heredität der Psychosen.* Arch. f. Psychiatrie u. Nervenkrank., Vol. 52, 1913.

It is quite true that in some cases of dementia præcox we find a history of some infection or traumatism which is perhaps to some extent responsible for the mental disorder. But it is equally true that in the great majority of cases, as far as we know, the disorder develops without any such cause.

From Meyer's point of view such a clinical picture as that of dementia præcox may be the result of an acquisition and unchecked development of vicious mental habits or of abnormal "types of reaction" which ultimately replace by substitution healthy and efficient mental reactions such as are necessary in our constant acts of adjustment to our usual environment as well as to newly arising situations.

The importance of this view lies in its bearing on therapeutics and, even to a greater extent, on prophylaxis.

To quote from the original paper:[1]

"Every individual is capable of reacting to a very great variety of situations by a limited number of reaction types."

"The full, wholesome, and complete reaction in any emergency or problem of activity is the final adjustment, complete or incomplete, but at any rate clearly planned so as to give a feeling of satisfaction and completion. At other times there results merely an act of perplexity or an evasive substitution. Some of the reactions to emergencies or difficult situations are mere temporizing attempts to tide over the difficulty, based on the hope that new interests crowd out what would be fruitless worry or disappointment; complete or incomplete forgetting is the most usual remedy of the results of failure, and just as inattention and distraction correct a tendency to overwork, so fault-finding with others, or imaginative thoughts, or praying, or other expedients, are relied upon to help over a disappointment, and, as a rule, successfully. Other responses are much more apt to become harmful, dangerous, uncontrollable—a rattled fumbling, or a tantrum, or a hysterical fit, or a merely partial suppression, an undercurrent, an uncorrected false lingering attitude, or whatever the reaction type of the individual may be. What is first a remedy of difficult situations can become a miscarriage of the remedial work of life, just as fever, from being an agent of self-defence, may become a danger and more destructive than its source. In the cases that tend to go to deterioration certain types of reactions occur in such frequency as to constitute

[1] Adolf Meyer. *Fundamental Conceptions of Dementia Præcox.* British Med. Jour., Sept. 29, 1906.

almost pathognomonic empirical units. I would mention hypochondriacal trends, ideas of reference, fault-finding or suspicions, or attempts to get over things with empty harping, unaccountable dream-like, frequently nocturnal episodes, often with fear and hallucinations, and leading to strange conduct, such as the running out into the street in nightdress, etc., or ideas of strange possessions with hallucinatory dissociations, or the occurrence of fantastic notions. All these appear either on the ground of a neurasthenoid development, or at times suddenly, on more or less insufficient provocation, with insufficient excuse, but often enough with evidence that the patient was habitually dreamy, dependent in his adjustment to the situations of the world rather on shirking than on an active aggressive management, scattered and distracted either in all the spheres of habits or at least in some of the essential domains of adjustment which must depend more or less on instinct or habit. On this ground reaction types which also occur in milder forms of inadequacy, in psychasthenia and hysteria or in religious ecstasy, etc., turn up on more inadequate foundation and with destructive rather than helpful results. We thus obtain the negativism no longer as healthy indifference and more or less self-sparing dodging, but distinctly as an uncontrollable, unreasoning, blocking factor. We obtain stereotypies not merely as substitutive reactions and automatisms on sufficient cause such as everybody will have, but, as it were, as a reaction of dead principle in a rut of least resistance. We see paranoic developments with the same inadequacy of starting point and failure in systematization, and in holding together the shattered personality, etc."

"Therapeutically, this way of going at the cases will furnish the best possible perspectives for action. We stand here at the beginning of a change which will make psychiatry interesting to the family physician and practitioner. As long as consumption was the leading concept of the dreaded condition of tuberculosis, its recognition very often came too late to make therapeutics tell. If dementia is the leading concept of a disorder, its recognition is the declaration of bankruptcy. To-day the physician thinks in terms of tuberculous infection, in terms of what favours its development or suppression; and long before 'consumption' comes to one's mind, the right principle of action is at hand—the change of habits of breathing poor air, of physical and mental ventilation, etc. In the same way, a knowledge of the working factors in dementia præcox will put us into a position of action, of habit-training, and of regulation of mental and physical hygiene, as long as the possible 'mental consumption' is merely a perspective and not an accomplished fact. To be sure, the conditions are not as simple as with an infectious process. The balancing of mental metabolism and its influence on the vegetative mechanisms can miscarry in many ways. The general principle is that many individuals cannot

afford to count on unlimited elasticity in the habitual use of certain habits of adjustment, that instincts will be undermined by persistent misapplication, and the delicate balance of mental adjustment and of its material substratum must largely depend on a maintenance of sound instinct and reaction type."

Meyer's views gain additional significance in the light of the more recent contribution of August Hoch,[1] who finds in a large percentage of his cases of dementia præcox (51–66%) evidences of a peculiar mental make-up which he has termed "shut-in personality." This make-up he defines as follows: "Persons who do not have a natural tendency to be open and to get into contact with the environment, who are reticent, seclusive, who cannot adapt themselves to situations, who are hard to influence, often sensitive and stubborn, but the latter more in a passive than an active way. They show little interest in what goes on, often do not participate in the pleasures, cares, and pursuits of those about them; although often sensitive they do not let others know what their conflicts are; they do not unburden their minds, are shy, and have a tendency to live in a world of fancies. This is the shut-in personality." And he adds further: "What is, after all, the deterioration in dementia præcox if not the expression of the constitutional tendencies in their extreme form, a shutting out of the outside world, a deterioration of interests in the environment, a living in a world apart?" For purposes of control Hoch examined the histories of his cases of manic-depressive psychoses and failed to find plain evidences of a marked shut-in personality.[2]

From a *biological viewpoint* dementia præcox, or at least its underlying constitution, may be regarded as a trait or a complex of traits somewhat analogous in its origin and mode of transmission by heredity to such traits as color of eyes, color of hair, stature, etc., and possessing medical and sociological interest only by reason of the disability by which it manifests itself.

[1] *Constitutional Factors in the Dementia Præcox Group.* Rev. of Neurol. and Psychiatry, Aug., 1910.

[2] Journ. of Nerv. and Ment. Dis., Apr., 1909.

No discussion of the nature of dementia præcox would be complete without a reference to the existence of various transition forms, firstly, between it and the normal mental condition, and, secondly, between it and other constitutional disorders, particularly arrests of development, epilepsy, paranoia, and manic-depressive psychoses.[1] Perhaps of similar significance are the familial relationships between dementia præcox and these disorders.[2]

The recognition of these facts led Adolf Meyer over fifteen years ago to provide in the official classification of the New York state hospitals such groups as "allied to dementia præcox" and "allied to manic-depressive psychoses."[3] Similar considerations led Bleuler later to widen the original Kraepelinian conception of dementia præcox by including, under the new name *schizophrenia*, various paranoic conditions, most psychoses arising on a basis of constitutional psychopathic inferiority, many somewhat impure psychoses usually assigned by others to the manic-depressive group, alcoholic delusional states, and other conditions which are for the most part so mild as to be rarely seen in institutions.[4]

Pathological Anatomy.—Until recently most psychiatrists placed dementia præcox among the so-called functional

[1] G. H. Kirby. *Catatonic Syndrome and Its Relation to Manic-Depressive Insanity.* Journ. of Nerv. and Mental Diseases, Nov., 1913. —T. W. Simon. *The Occurrence of Convulsions in Dementia Præcox, Manic-Depressive Insanity and the Allied Groups.* N. Y. State Hosp. Bulletin, Nov., 1914.

[2] Berze. *Die hereditären Beziehungen der Dementia Præcox.*—A. J. Rosanoff. *Dissimilar Heredity in Mental Disease.* Amer. Journ. of Insanity, July, 1913.—A. S. Moore. *Some Preliminary Observations Concerning the Types of Psychoses Occurring in the Individual Members of Families.* N. Y. State Hosp. Bulletin, May, 1913.—A. Meyerson. *Psychiatric Family Studies.* Amer. Journ. of Insanity, Jan., 1917, and April, 1918.

[3] Adolf Meyer. Seventeenth Annual Report, N. Y. State Commission in Lunacy, 1904–1905.

[4] E. Bleuler. *Dementia præcox oder Gruppe der Schizophrenien.* Aschaffenburg's Handbuch der Psychiatrie, Vol. IV. Leipsic and Vienna, 1911.

disorders. The newer studies have, however, revealed fairly constant, though not pathognomonic, anatomical changes. Alzheimer and others working by his methods have found products of nerve cell degeneration within nerve cells, in the clear spaces around them, and especially in the perivascular spaces.[1] Southard, having selected 37 cases of dementia præcox showing at autopsy no coarse complicating features like brain atrophy, intracranial arteriosclerosis, etc., has found in 19 foci of gliosis distinctly palpable in the fresh brains.[2] Rosanoff, making use of an improved method for measuring brain atrophy, consisting essentially in observing the relationship between cranial capacity and brain weight, has found very close and constant correlation between the degree of mental deterioration observed clinically and that of atrophy found at autopsy in cases of dementia præcox; from this he has drawn the conclusion that "dementia præcox is associated in some way with changes in the brain which lead to atrophy." [3]

Treatment.—Excitement, refusal of food, dangerous tendencies are treated, as they arise, by the methods already described in the first part of this book. An effort should be made to combat stereotypy in all its forms by suggestion and by diversion and occupation. Employment at useful labor is desirable also from the economic standpoint; precocious dements constitute a large proportion of institution workers and thus contribute toward their support.

[1] Alzheimer. *Beiträge zur Kenntniss der pathologischen Neuroglia und ihrer Beziehungen zu den Abbauvorgängen in nervösen Gewebe.* Histologische und histopathologische Arbeiten über die Grosshirnrinde, 3, 1910.—Sioli. *Histologische Befunde bei Dementia Præcox.* Allg. Zeitschr. f. Psychiatrie, Vol. XLVI, p. 195, 1909.—Orton. *A Study of the Brain in a Case of Catatonic Hirntod.* Amer. Journ. of Insanity, Apr., 1913.

[2] Southard. *A Study of the Dementia Præcox Group in the Light of Certain Cases Showing Anomalies or Scleroses in Particular Brain Regions.* Amer. Journ. of Insanity, July, 1910.

[3] Rosanoff. *A Study of Brain Atrophy in Relation to Insanity.* Amer. Journ. of Insanity, July, 1914.

CHAPTER V

PARANOIA[1]

Paranoia is to be looked upon as the development of a morbid germ the existence of which manifests itself in early life by anomalies of character. These anomalies may be, to use the apt expression of Séglas, "summarized in two words: conceit and suspicion." At a certain time the pathological tendencies of the subject find their expression in a fixed idea, and the delusional state is established.

Onset.—Sometimes it is slow and gradual, much more frequently rapid, almost sudden.

In the first case the dominant traits of the personality become accentuated little by little. The patient grows more and more suspicious and vain and believes himself to be the object of malevolent or, on the contrary, admiring reflections. Delusional interpretations become more and more numerous until finally the *fixed idea* appears, an idea of persecution or of grandeur, around which a whole delusional system is subsequently built up.

In the second case the fixed idea is primary in relation to the delusional interpretations. Sometimes the fixed idea appears in childhood, as in a case of Magnan's: the boy when questioned concerning his vocation replied that he was going to become a pope. Sander has described this form under the name *paranoïa originaire*.

Usually the fixed idca appears at a later period, in youth or in adult age. Often it is based upon some rcal

[1] Leroy. *Les persécutés persécuteurs.* Thèse de Paris, 1896.—Ballet et Roubinowitch. *Les persécutés persécuteurs.*—Magnan, *Leçons cliniques.*

fact the significance of which the patient misinterprets or the importance of which he exaggerates: perfectly justifiable disciplinary measures to which he is subjected, loss of money, or sometimes, indeed, a true injustice, against which, however, nothing can be done, may determine the onsct of the disease. Often, also, it has for its basis the extreme credulity of the patient, who takes in earnest a simple pleasantry or some idle remark. "He resembles Napoleon," was once remarked by someone in the presence of a psychopath. Immediately the latter conceived the idea that he belonged to the royal family and that he was "the Master of France," and this formed the starting point of his system of delusions.

Fundamental Features of the Disease.—As soon as the theme, that is to say the fixed idea, is formed, the disease develops very rapidly and is charactcrized by:

(1) The immutability of the basic fixed idea;

(2) The absolute faith which the patient has in his delusions;

(3) The *apparent* logic of the delusional system;

(4) The promptness and intensity of the reactions;

(5) The absence or at least extreme rarity of hallucinations and the presence of numerous false interpretations;

(6) The absence of mental deterioration regardless of the length of time that the disease has lasted.

The following brief abstract from the history of a case illustrates these characteristics in a somewhat schematic fashion:

A schoolmaster, who was a man of average intelligence, but suspicious and conceited, failed to rcceive a promotion which he believed he had a right to expect. The idea that he was the victim of a grave injustice arosc in his mind and never left it (*immutability of the fixed idea*). Thc reasonings of his friends and relatives could not alter his conviction and failed to dissuade him from addressing a letter of strong protestation to the school director (*absolute faith in his delusions, promptness and intensity of the reactions*). This producing no effect other than the loss of his position, he applicd to the minister of public instruction, to the presidcnt of the republic, to the tribunals. He found no justice, but neverthelcss retained confidence in the excellence

of his cause, attributing his successive disappointments to dishonesty of the representatives of authority and justice, who he claimed were in league against him because his high intellect overshadowed them. Everything now became clear to him; he understood the distrust shown towards him and the attention which he attracted wherever he went (*apparent logic of the delusions, false interpretations*). Finally committed, he continued to protest against his persecutors, among whom were included, as might be expected, the physician who treated him and the police officer who arrested him; the memory still remains perfect and the mind lucid, although the disease has now lasted over twenty-five years (*absence of mental deterioration*).

It is often stated that the delusions of paranoiaes are, in a manner, logical; that is to say, when the fixed idea once appears, the secondary delusional conceptions are the natural outcome. Thus presented, this statement is not correct. In fact, if these patients possessed a faultless logic it would render apparent to them the ineonsistency of their fixed idea, which would be immediately abolished. It is quite true that these patients are very apt to use and abuse deductions and syllogisms, which trait has gained for them the name of the *reasoning insane*. But their logic is only apparent; their reasoning is always tainted with the same original vice that leads them to the systematic rejection of arguments opposing their ideas, and the ready acceptance of hypotheses which arise in their minds as a result of their pathological preoccupations. Hence their delusional interpretations, which become more numerous each day and upon which they base their arguments, and the childish character of the proofs which they accumulate. A vague word or an evasive reply often suffices to convince them that their point of view has been adopted and that their cause has been accepted. The concessions occasionally made by those against whom their delusions are directed, become, in their eyes, ample proof that these people admit their guilt; thus misinterpreted chance occurrences serve to feed the system of delusions.

Quite frequently their reasoning, subtle and plausible, though radieally false, is imposed upon suggestible individuals

or upon those of shallow minds. Thus they often have defenders who show more zeal than intelligence.

Forms.—"According to their special morbid tendencies paranoiacs may be classed in different groups: the *litigious paranoiacs* (*paranoia querulens* of the Germans), who prosecute their imaginary rights in the courts; the *hypochondriacal paranoiacs*, who, believing themselves to have been once improperly treated by a physician, bear a grudge against all physicians whom they may meet in the course of their treatment, and annoy them in various ways; the *filial paranoiacs*, who believe that they have found their father in some stranger, whom they constantly annoy with their expressions of tenderness and with their claims. Another group is formed by the *amorous paranoiacs:* Teulat, the lover of Princess de B——, was a splendid example of this type." (Magnan.)

To the preceding groups should be added the *jealous paranoiacs*, in whom the delusions assume the form of morbid jealousy; *inventors* who are indignant for the rejection of their fantastic inventions;[1] *mystics* and *founders of religions* who often succeed in gathering under their banners an imposing train of feeble-minded, or at least unbalanced, individuals, etc.

The list might be extended indefinitely; it is useless, however, for whatever be the nature of the fixed idea, the clinical characteristics of the delusional state do not vary.

Diagnosis.—The first question that may arise in the mind of the physician is, Are the ideas of the subject *delusional* or not? It is not always easy to answer this question. Delusions sometimes appear very plausible, while, on the other hand, well-based claims may resemble the delusions of paranoia on account of the obstinacy with which they are urged. Only by a very careful investigation of each case can errors be avoided.

The diagnosis is to be based upon the fundamental

[1] Delarras. *Contribution à l'étude du délire des inventeurs.* Thèse de Bordeaux, 1900.

characters enumerated above; all these characters in combination are not observed in any other psychosis.

In favor of *paranoid dementia* are mental deterioration and the more mobile character of the delusions. In *délire chronique* there are the constant presence of hallucinations and a progressive evolution of the disease. In *alcoholic delusion of jealousy* we find less perfect systematization, presence of hallucinations, history and physical signs of alcoholism, and tendency toward recovery.

Prognosis and Treatment.—Paranoia is a chronic, incurable affection which, as we have seen, entails no mental deterioration.

The violence of the reactions sometimes renders commitment necessary. There are no known means for combating the delusions. Psychic treatment has no influence whatever.

CHAPTER VI

MANIC-DEPRESSIVE PSYCHOSES [1]

Manic-depressive psychoses are manifested in attacks presenting a double characteristic: a tendency toward recovery without mental deterioration and a tendency toward recurrency. From a symptomatic standpoint the attacks are of three types, which we shall describe successively:

Manic type;
Depressed type;
Mixed types.

§ 1. Manic Type

Mania presents itself in three principal forms: simple mania, delusional mania, and confused mania. We shall first study simple mania, which, more clearly than the other forms, exhibits the following four fundamental symptoms of the disease:

Flight of ideas;
Morbid euphoria and irritability;
Impulsive character of the reactions;
Motor excitement.

Simple Mania.—*Prodromata.*—The phenomena of manie excitement are almost constantly preceded by a period of depression characterized by diminution of psychic activity, which sometimes amounts to a veritable melancholic state. Later on we shall see the importance of this prodromal period as an argument for the unity of manic-depressive psychoses.

[1] Kraepelin. *Lehrbuch der Psychiatrie,* Vol. II.—Weygandt. *Ueber das manisch-depressives Irresein.* Berlin. klin. Woch., 1901, Nos. 4 and 5.

External Aspect.—The face is flushed, the eyes brilliant, the expression happy and animated. The manner and gestures indicate a state of ease contrasting often with the usual timidity of the patient. The dress is showy, ridiculous, and ornamented with gaudy trinkets; the clothes are in disorder, perhaps put on inside out. In women a bodice excessively *décolleté* and the skirt raised too high show also the erotic tendencies.

Intellectual Disorders.—Lucidity is perfect, orientation and memory are intact.

The *attention*, very *mobile*, is distracted by all external impressions.

Associations of ideas, uncontrolled, are formed at random from similarities of sound, superficial resemblances, coexistences in time and space, etc. *Flight of ideas* is here encountered in its typical form.

These two symptoms, mobility of attention (distractibility) and flight of ideas, are, as we have already seen, an expression of weakening of normal psychic activity and predominance of mental automatism. Under these conditions the capacity for intellectual labor is diminished.

The *judgment*, which is largely dependent upon associations of ideas, is always profoundly disordered. Though occasionally the patient surprises one by the accuracy of his observation, it is always the result of a sort of automatic appreciation bearing upon some isolated fact. But since judgment necessitates the systematic grouping of a very considerable number of ideas, it is here absent or at least impaired. A maniac who notices some slight defect in the dress of the examiner is incapable of appreciating the importance of an event or of an act.

Affective Disorders.—These consist in *morbid euphoria* and *irritability*.

The *euphoria* is often very marked. Many patients after recovery declare that they had never felt so happy as they did during the attack. The maniac is pleased with everything, and the contrast is particularly striking

when the excitement follows a period of depression (attack of double form). The most imperturbable optimism replaces the pessimism of other days. Of disease insight there is no question at all; the subject "never before felt so well"; if he is "somewhat nervous" the fault is with his relatives, the physicians, or the nurses, who constantly interfere with him. With his intelligence and activity he could "easily conduct important and gigantic enterprises." If he were allowed liberty of action, he would show everybody what he is capable of.

Sad impressions are dismissed with a vague remark or a joke. A maniac, reminded of the loss of his property in a fire (which incidentally was the cause of his attack), replied laughingly: "Money does not bring happiness, and besides I shall have earned twice as much six months from now."

This optimism, however, is never so absurd as that of general paralytics or senile dements. Dumas cites the case of a general paralytic who, reminded of the recent death of his two little daughters, replied: "Well, well! I shall resuscitate them." A maniac would never have given such an answer.

The *irritability* is evident in the violent outbursts of anger which occur on the slightest provocation. The maniac will bear no contradiction and will accept no suggestions.

The *moral sense* is always diminished; the sense of propriety is greatly affected. The maniac is cynical, dishonest, and mischievous. "He lies, cheats, and steals without the least scruple. He allows himself anything that in others he would condemn" (Wernicke). Quite frequently he will tease and mock others. If in the midst of his rambling speech some pointed or amusing remark occurs, it is always at the expense of others.

Erotic tendencies form an integral part of the picture: the patients abandon themselves to them without shame. Men previously exemplary in habits go around with pros-

titutes. Young girls, normally very reserved in their manner, offer themselves to everybody.

One frequently sees maniacs indulging in *alcoholic excesses.*

The patient is incapable of appreciating the significance of his acts either before or after they are accomplished. The most deprecable acts are displayed with complacency and become the objects of cynical pleasantries; compunction and scruples are absent.

Reactions.—The elements of *manic excitement* consist in: imperative pressure of movement, abnormal rapidity of reactions, and impulsive character of the acts.

Manic excitement always has a psychic origin (Wernicke); the acts, though impulsive, are dependent upon an appreciable cause and have a definite purpose.

This excitement often assumes the aspect of morbid activity which, lacking in logical sequence, remains unproductive when it does not become harmful. The maniac every instant leaves one task to begin another, or undertakes tasks for which he possesses neither the necessary aptitude nor the qualifications. A farmer, fifty years of age and scarcely able to read or write, wanted to undertake the study of Hebrew " to unite the Jews and the Protestants."

The maniac is strongly inclined to intrude into the affairs of others, causing, as might be expected, much trouble. He offers his advice and assistance to everybody. In the hospital he accompanies the physician on his rounds, makes diagnoses, and prescribes treatment. Often he tries to assist the nurses, who find it very difficult to moderate his zeal.

In the more marked degrees the excitement leads the patient to many eccentricities. He removes his clothing, replaces it; executes pirouettes and dangerous leaps; sings obscene songs; performs grimaces and contortions for the amusement of his spectators; and frequently annoys others in a thousand ways.

The *conversation* is animated, strewn with eccentric expressions, strange words and puns. The language may

be either profane and obscene or marked by a labored refinement. The tone may be jocose or solemn, accompanied by the gestures of a gamin or, on the contrary, by those of a commander or a preacher. There is often veritable *logorrhœa.*

The *writing* presents analogous characteristics. Volubility and prolixity are manifested by whole pages scribbled within a few minutes. The lines cross each other in every direction, the letters are large in size, and capitals and flourishes are abundant. Often there is *manic graphorrhœa,* analogous to the manic logorrhœa referred to above.

The discourse is conducted at random: reflections upon questions of transcendental philosophy as well as upon those of dress or cooking; slander and intimate confidences, extravagant projects, and erotic proposals. The maniac conceals nothing.

Physical Symptoms.—We find in mania the physical symptoms which, we have already seen, are associated with morbid euphoria: the general nutrition and the peripheral circulation are active, the pulse is full and rapid, respiration is deep and accelerated, the appetite is good, and the weight increases.

Sleep is diminished, occasionally altogether absent; but in spite of the insomnia the patient experiences no fatigue.

Often in women the menses are suspended, and their return indicates the approach of recovery. When they persist through the attack their appearance is likely to provoke a recrudescence of excitement.

Delusional Mania.—The fundamental symptoms are the same as those of simple mania. The excitement may be more marked and the lucidity perhaps transitorily disturbed.

The delusions are usually *mobile* and consist in *ideas of grandeur.*

The most varied delusions follow each other, modified every instant by external impressions. The patient assumes all the titles mentioned to him: he is in turn pope, physician,

and admiral. Occasionally the delusions are referred to the past and take the form of *pseudo-reminiscences:* a shoemaker pretended to have directed an expedition to the North Pole.

The patient often transforms the surroundings in which he finds himself. A maniac called the head nurse of the service where he was treated the chief of his military station, and the physician the prince of Sagan.

The costume corresponds with the delusions: the patients clothe themselves in fantastic uniforms, cover their chests with decorations, comb their hair in the style of Bonaparte, etc.

Sometimes one delusion persists and remains fixed during the entire duration of the attack in the midst of more mobile accessory delusions: a modest business agent for several months proclaimed himself to be the President of France, and referred to the physicians and nurses as his "grand staff."

The maniac never has absolute faith in his delusions. His conviction is easily shaken. Often he only half believes in the pompous titles that he gives himself; his delusions are a sort of pleasantry with which he amuses himself and with which he mystifies those about him.

Some ideas of persecution, mostly bearing upon the deprivation of liberty, may occur in addition to the ideas of grandeur. In some cases even hypochondriacal ideas may occur. The patient declares that he is afflicted with a grave disease, but that he will cure himself "by taking a trip to London" or by having an operation done by "the greatest specialists of Paris and America."

Hallucinations are rare and fleeting. On the other hand, *illusions* are frequent and lasting; they often assume the form of mistakes of identity: the patient is apt to believe himself surrounded by his acquaintances and by familiar objects.

In grave forms, during the excited paroxysms, consciousness at times undergoes a *certain degree of clouding*

and the period of illness leaves but a very vague impression, or none at all, upon the memory.

The following case is a good example of delusional mania.

Gabrielle L., fifty-two years old, housewife. Family history unknown. The patient has always been impressionable and lively; intelligence normal. She had five previous attacks of mania, the first at the age of nineteen; all terminated in recovery.

The present attack began with rambling speech, assaults upon others, and tendency to alcoholic excesses; the patient, though usually temperate, began to drink to intoxication. She was taken to the Clermont Asylum, where Dr. Boîteaux issued the following certificate of lunacy: "Condition of acute mania with extreme disorder of ideation, speech, and conduct. Illusions of the senses. Obscene actions. Ideas of grandeur: owns millions, heavens and earth. Excited, difficult to control."

On February 25, 1904, one month after the patient's admission to the asylum, examination was as follows: Medium stature, strong constitution, slight obesity, skin flushed, voice loud, gestures lively, clothing disarranged, hair down over the shoulders. From the beginning the patient showed extreme familiarity. She offered her arm to the physician, whom she took to be the husband of the head nurse, and laughingly asked the latter if she was not jealous. She was well oriented as to place; she knew that she was in the Insane Asylum at Clermont where she had already been five times before. Her orientation of time was somewhat inaccurate: she said the year was 1904, that it was the spring of the year, and gave the date as March 25 (actual date February 25, 1904); on being asked to think a while and make sure of the date, she said: "Why, of course it is March, a few days ago we had a holiday, that was Mid-Lent." (She was evidently referring to Shrove Tuesday.) Later other ideas appeared and it became impossible to prevail upon the patient to reflect properly before speaking. She had a certain realization of her condition: she said she felt odd, "at times driven to play all sorts of silly pranks." She was very obedient, and always started out with remarkable eagerness to carry out any order that might be given her. But her extremely mobile attention caused her to be each instant distracted from the object to be attained. She was asked to write a letter: "Why, certainly! To whom?" To whomever you wish. "Very well, to the President of the Republic? To the Minister of War? No, I shall write to my husband." Then she began to write: *To Mr. L., Gardener in C. . .* . Then turning again to the physician: "Because, you know, we have been living in C. . . . for the past eighteen years. I have a house there. The hospital at C. . . belongs to me. I

know Sister Antoinette there. They wanted me to disguise myself as a Sister, but my husband wouldn't have it. He adores me, my husband does!" She was again asked to write, which she did, jabbering all the time and reading aloud everything she wrote. Every moment her attention kept being distracted by the conversation of the persons in the room, although they spoke in a low voice and upon matters which did not concern the patient. They spoke, in fact, about another patient who helped the nurses with the service in the dining-room. "Good gracious!" exclaimed the patient, interrupting her writing and bursting out with laughter, "that woman is pretty stingy with her bread! One would think she was paying for it! It was I that gave her the money to buy it with!" When asked again to continue her letter she willingly resumed her writing. A minute later they spoke about another patient, and someone made the remark, "She does not sleep." This started the patient again: "Who, I? I don't sleep? Why, I sleep like a dormouse!" It is to be noted that she wrote slowly, seeking for words. Having had but little schooling, writing in her case did not develop into an automatic function. She threw down her pen after having written a few disconnected lines. She was then given a paper and asked to read aloud one of the news items. Her attention was at once attracted by a picture below the news item and she exclaimed, pointing to it: "Here is a pretty woman! She resembles Mrs. P." She was again urged to read. She read the first line with difficulty, owing to her poor vision, and continued to read on the same level in the next column. Again the above news item was pointed out to her. It was about some poor old man. The patient at once stopped her reading. "This is a jolly story! The poor old man! and the veterans! I visited them once, also the buildings for arts and for commerce." With a good deal of urging she was finally induced to read the entire news item; but it made very little impression on her mind; a quarter of an hour later she was unable to tell even briefly what she had read, declaring simply that it was something about an old man. "It is very sad," she added, "sad and humiliating. Thinking of death always distresses me, but I am very fond of flowers. My husband is a gardener in C. . . . He buys his seeds from Vilmorin, also his tobacco." Numerous unsystematized *grandiose delusions:* she is a midwife, she studied for forty years; she is a millionairess, owns mansions; her husband has invented perpetual motion, made the model with nothing but his knife; he has also invented a method for making cheese boxes out of the stalks of rye, which he will sell for ten cents apiece. He is related to the king of Italy and is of noble descent. In her delusions the patient showed marked suggestibility: she was asked, "Have you ever been on the stage?"—"Why, yes, I played in *The Chimes of Normandy.*" Here she began to sing: "Will you look this way, will you look that

way?" Her children are also actors. She played with them at the Castle Theatre, also with Sarah Bernhardt. Here her eye fell upon the word "Minister" printed in large letters in the paper; she said: "My husband has not yet been made Minister, but with his ability he will not have to wait long." She has no hallucinations, but numerous *illusions*, especially those of vision. She thinks she knows all those about her. One nurse is her cousin, another is her neighbor living across the street. Her *motor excitement* is very marked. The patient tries to do every kind of work; she makes a few sweeps with the broom, then suddenly rushes to assist a nurse carrying a pail of water, then leaves the nurse with her pail of water to go and make peace between two quarreling patients. Without any intention of malice, she has frequent altercations with other patients who are annoyed by her screams, her songs, and her wild pranks. She picks up all sorts of objects and accumulates them in her clothes: scraps of paper, bits of glass, wood, and metal, pieces of bread and cheese. She herself laughs when an inventory is taken of all this rubbish, and makes no objection to its being taken away from her.

No noteworthy disorders in her general condition. She eats at all times, abundantly and gluttonously. Sleep somewhat disturbed: she passes part of the night wandering about the dormitory, singing and jabbering.

Confused Mania.—Clouding of consciousness is here permanent. The attack begins suddenly or after a short prodromal period, characterized from the beginning by complete disorientation, very great excitement, and totally incoherent delusions. Numerous hallucinations always accompany the delusions. The form of the delusions is very variable: in confused mania are often encountered ideas of grandeur, persecution, and occasionally, by way of an accidental episode, some melancholy delusions.

Even when the grandiose ideas predominate euphoria is very frequently absent. The cause of this anomaly probably exists in the purely automatic character of all the psychic manifestations. To provoke a sense of pleasure activity must be conscious, that is to say, accompanied by a voluntary effort, no matter how slight; whereas in confused mania fragmentation of the personality is such that flight of ideas is effected with extreme facility: effort is absent and with it the euphoria.

The patient loses weight, the features become drawn out, the pulse grows small and depressible. The intensity of the excitement permits of no regular alimentation.

Filthy tendencies are frequent: unless watched constantly the patient is apt to smear the walls, his bed, his clothing, and his body with fæces. Some will even eat fæces.

The attack may terminate in death, either from exhaustion or from some complication: pneumonia, suppuration occasioned by traumatism, etc.

General Course, Duration, and Prognosis of a Manic Attack.—The course of mania is capricious. In a general way it may be represented by a curve which at first ascends, then remains horizontal for some length of time, and finally gradually descends. But this curve, far from being regular, is interrupted by oscillations indicating either sudden exacerbations or attenuations of the symptoms, or even remissions the duration of which may vary from several minutes to several days.

The progress of the attack may also be interrupted by phenomena of depression which are sometimes quite marked, though very brief in duration. As we shall see later on, this fact contributes to the proof of the homogeneity of manic-depressive phychoses.

The *duration* of the attack, whatever its form, cannot be predicted. Some attacks terminate in a few hours, deserving a place among the *transitory psychoses*, others continue for several years.

The *prognosis*, leaving out the cases in which life is endangered by the intensity of the excitement or by some complication, is *favorable* as to termination of the attack. Recovery with *restitutio ad integrum* is the rule.

In some cases recovery has been observed to occur following some acute somatic disease.

Treatment.—Rest in bed in these cases performs miracles. It is well accepted and easily instituted. Unfortunately it is not possible at present to say whether or not it actually shortens the duration of the attack.

§ 2. Depressed Type

The fundamental symptoms of the depressed type are:
Psychic inhibition;
A painful emotional state associated with indifference;
Aboulia.

As in the case of mania, we distinguish here three forms: simple, delusional, and stuporous depression.

Simple Depression.—*Onset.*—Usually insidious, preceded by ill-defined prodromata, such as general tired feeling, insomnia, anorexia, discouragement.

The *external aspect* of the patient is one of sadness, listlessness, and indifference. The features are drawn out, head bowed down upon the chest, arms hanging inertly at the sides or resting upon the knees. The general bearing is slouchy.

Intellectual Disorders.—The *psychic inhibition* brings about very marked weakening of attention and considerable sluggishness of the association of ideas. All intellectual exertion, such as narration of an event well known to the patient or a small calculation, is impossible or can be accomplished only after repeated and painful efforts. Though lucidity is intact, *perceptions* are incomplete, uncertain and often inaccurate. Everything appears to the patient strange or unrecognizable: persons, objects, and even his own body. Here we have a condition bordering upon a delusional state. Another step and we have illusions and hypochondriacal ideas.

The disorders of *judgment* are less marked than in mania. The patient is quite frequently conscious of his condition to some extent. He feels that he is changed, ill, and it seems to him that his mind is paralyzed.

Affective Disorders.—The mood is sad, gloomy, pessimistic. The patient emits monotonous groans. While the maniac brings disorder into the hospital, the melancholiac brings depression and gloom.

Psychic anæsthesia is usually marked, and sometimes the patient is conscious of it. He complains of having become indifferent toward everything, of experiencing no affection.

Upon this general state of depression and sadness may be engrafted a spell of anxiety, usually transient. In no case, however, is the psychic pain as intense as in involutional melancholia. The depressed phases of manic-depressive psychoses correspond to passive depression.

Disorders of the Reactions.—These all result from the marked aboulia present in such cases, which is, in its turn, a manifestation of the psychic paralysis.

The execution of the simplest act necessitates an effort so great at times that the patient gives up the attempt. Like the psychic indifference, this symptom may be a conscious one.

Combined with insufficiency of perception, aboulia brings about *doubt.* The patient lives in constant indecision and uncertainty.

Conversation with the paticnt is most unsatisfactory. Often, in spite of all persistence, the patient remains mute or responds by an unintelligible murmur or whispering. The mental synthesis necessary for an elaboration of a response is impossible for him. In the milder cases, to some very simple questions repeated several times brief answers are obtained.

The voice is scarcely audible, the speech is indistinct. The same words are constantly reiterated, expressing doubt, indecision, sadness: "What is this? . . . What is going to happen? . . . This is frightful."

The *writing* is slow; letters are poorly formed, small, disconnected.

Physical Symptoms.—These have already been described in connection with morbid depression. We shall review them briefly.

The peripheral circulation is sluggish, the extremities cold and cyanotic. The pulse is small, of low tension,

sometimes slowed. The heart sounds are muffled. The temperature may be subnormal.

The coated tongue, fetid breath, a sense of weight in the stomach, constipation, and anorexia reveal a *poor state of the digestive functions.*

Loss of weight is a constant phenomenon. The return to the normal weight always indicates the end of the attack.

Sleep is diminished, unrefreshing, disturbed by nightmares.

Often the patient complains of *headache* and of *vague pains* in the limbs.

Cutaneous sensibility is blunted.

The *tendon reflexes* are often diminished.

Delusional Depression.—Always secondary to the emotional state, the delusions are preceded by a longer or shorter period of simple depression.

They present the usual characters of depressive ideas and assume the most varied forms: hypochondriacal ideas, ideas of humility, of self-accusation, or of ruin, fear of terrible punishment.

As in involutional melancholia, the morbid idea may occur at first in the shape of an imperative idea. The mind realizes it is false and tries to reject it. After a more or less prolonged struggle, the mind yields: the *imperative idea* becomes a *fixed idea,* and a delusional state is established.

Occasionally these delusions are quite absurd and resemble those of dementia præcox. In other cases they are associated with ideas of persecution and become systematized to a certain extent, constituting a systematized delusional state of self-accusation or of persecution, as the case may be.

Hallucinations are rare. The least exceptional are those of vision.

Illusions, though less numerous than in mania, are, however, quite frequent. Following the general rule, the psycho-sensory disorders are an expression of the delusional preoccupations.

Lucidity may be transitorily affected. The usual inertia is sometimes effaced and replaced by a certain degree of excitement. In other cases it becomes, on the contrary, more marked, giving rise to transient stupor.

Depression with Stupor.—This form rarely begins as such; it is usually preceded by simple or delusional depression.

The characteristic trait here is complete inertia, associated with absolute indifference to all external impressions. The physiognomy is stupid, sometimes expressing fear.

The usual physical symptoms of depression are here very pronounced.

Almost always the patient becomes negligent and *filthy*, wetting and soiling his bed.

In some cases may be observed a tendency to cataleptoid attitudes.

The stupor may have one of *two different origins:*

(1) Psychic inhibition reaching an extreme degree of intensity suppresses all conscious and voluntary intellectual activity. The indifference is complete, the psychic pain, on the contrary, becoming *nil;* in fact inhibition is never perceived as a painful phenomenon unless the mind seeks to overcome it; in stupor the arrest of psychic activity is so complete that the patient makes no attempt to react.

(2) The patient's mind is preoccupied by intense, frightful delusions. There is an endless succession of terrifying hallucinations analogous to those of epileptic delirium. The patient is in a frightful nightmare which completely absorbs him, rendering him insensible to impressions of the external world.

Course, Duration, and Prognosis of the Depressed Type of Manic-Depressive Psychoses.—As in mania, the course is irregular, interrupted by temporary remissions and exacerbations. The duration varies within very wide limits, from a few days to several months or even years; the prognosis is always favorable for recovery from the attack, except in cases with grave somatic complications.

Physical improvement, especially increase in weight, usually indicates the approach of recovery.

The **treatment** consists in:

(1) Sustaining the strength of the patient by rest, especially rest in bed, and by a plentiful and nutritious diet;

(2) Careful watching to prevent suicide;

(3) Calming agitation, when present, by the usual procedures;

(4) Combating the gastric disorders and the phenomena of autointoxication that are so frequent in states of depression.

Psychic treatment in the form of suggestion, moderate physical and intellectual labor, etc., is of great service during convalescence, but is contraindicated during the acute period of the disease.

§ 3. Mixed Types

Attacks of Mixed Form, Properly so Called.—Kraepelin has thrown light upon the true nature of these cases, which are more frequent than is generally supposed and in which the symptoms of excitement and of depression appear in the same patient at the same time.

In one group of cases the usual signs of depression are associated with extreme mobility of attention and veritable flight of ideas. The patients complain that the direction of their thoughts escapes them. "My head always wanders," said one such patient: "I cannot fix my attention upon anything." Occasionally there is *melancholic logorrhœa.* Many depressed patients show a surprising prolixity and harass those about them by unceasing incoherent lamentations about their unhappy lives.[1]

In a second group of cases the disease presents itself with the characteristics of *manic stupor* (Kraepelin). The psychic paralysis is associated with more or less pronounced

[1] Kraepelin. *Loc cit.*, p. 545.

excitement: the patient is constantly moving, disarranges his bed, tears his clothes, soils the walls of his room, and at the same time shows such dulling of the mind that even the simplest questions put to him remain unanswered.

Finally, in a third group, inhibition is less pronounced, and the elated mood of mania is replaced by an uneasy, gloomy, irritable one, the basis of which is sadness, like in the depressed type.

The mixed type sometimes persists through the entire duration of the attack. More frequently it is met with in the transition periods of circular psychoses, where the patient wavers, so to speak, between excitement and depression.

Attacks of Double Form.—Each attack here consists of *two periods:* a period of depression and one of excitement. It usually begins with the depression.

The transition from depression to excitement occurs either suddenly—a patient goes to bed a melancholiac and rises the next morning a maniac—or gradually, with an intervening period of a mixed condition, as mentioned above. The psychomotor inhibition gradually becomes less prominent and is replaced by excitement; flight of ideas and logorrhœa appear. Finally the sadness disappears and elation replaces it.

When a maniac falls into depression the same transition occurs inversely.

The *treatment* of each phase comprises the same indications as for attacks of simple depression and of mania respectively.

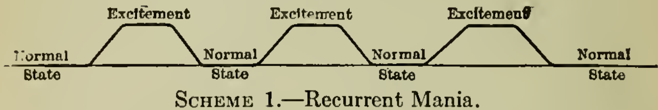
§ 4. General Course—Prognosis—General Considerations—Treatment

Manic-depressive attacks present a very marked tendency to recur. According to the particular forms assumed by the successive attacks, several types of manic-depressive psychoses are distinguished.

(A) Periodic psychoses:
 (*a*) Recurrent mania;
 (*b*) Recurrent depression.
(B) Alternating psychoses.
(C) Psychoses of double form.
(D) Circular psychoses.
(E) Irregular forms.

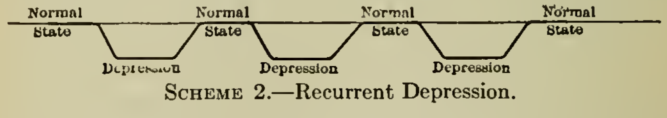
(A) **Periodic Psychoses.**—(*a*) *Recurrent Mania.*—The attacks are always of the manic type and are separated from each other by normal periods. The number of attacks and the duration of the normal periods vary greatly. Some patients have but two or three attacks during their lifetime; it is altogether exceptional for an individual to have but one attack, at least if his life is a long one. In all likelihood non-recurring mania does not exist.

In other cases the attacks follow each other at brief intervals and with a certain regularity.



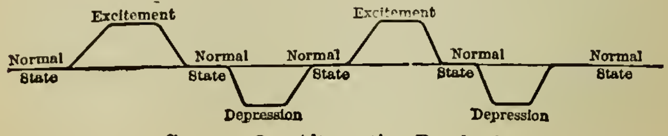
SCHEME 1.—Recurrent Mania.

(*b*) *Recurrent Depression.*—Less frequent than the preceding, this form is, so to speak, its counterpart. What has been said about recurrent mania is applicable to recurrent depression.



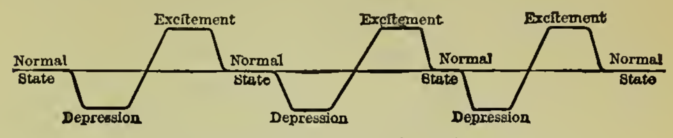
SCHEME 2.—Recurrent Depression.

(B) **Alternating Psychoses.**—Attacks of mania and those of depression alternate and are separated from each other by normal intervals.



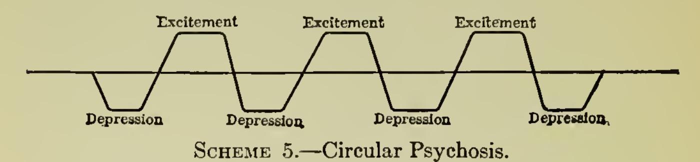
SCHEME 3.—Alternating Psychosis.

(C) **Psychoses of Double Form.**—Each attack consists of a period of depression and one of excitement; the attacks are separated from each other by normal intervals.



SCHEME 4.—Psychosis of Double Form.

(D) **Circular Psychoses.**—Attacks of double form follow each other without interruption.



SCHEME 5.—Circular Psychosis.

(E) **Irregular Forms.**—These are most frequent. The attacks follow each other without order or regularity, assuming at random the depressed, manic, or mixed form.

Finally, one may observe the periodic, circular, and irregular forms combine in a complex manner, so that, for instance, a patient with a circular psychosis becomes a periodic maniac for a time, or a patient whose previous attacks have all been of the manic type presents an attack of depression.

It is quite frequent, though not constant, to see attacks of the same type present each time the same aspect: a manic attack resembles previous ones in the same patient, and it is very probable that the future manic attacks will present the same features.

The **general prognosis of the disease** is not favorable. The attacks have in some cases a tendency to come closer together, so that the normal intervals became gradually shorter and shorter until they are either totally wanting or almost so.

Etiology.—Manic-depressive psychoses are common.

According to Kraepelin they represent about 15% of all admissions to psychopathic hospitals.

The *causes* are not fully known; the essential feature in the etiology seems to be a constitutional predisposition which is believed to be inherited. The heredity is often similar.[1]

The predisposition to have manic-depressive attacks seems to be observed with particular frequency in persons of certain fairly well defined mental make-up; such make-up is characterized either by a constitutional pessimism, gloomy or worrisome disposition, or, on the contrary, by a happy, exuberant, demonstrative temperament, or, finally, by emotional instability consisting of exaggerated reactions to situations by despair, discouragement, or by premature and unwarranted display of triumph and hopefulness, as the case may be. This was pointed out by Hoch,[2] who has emphasized particularly the contrast which such personalities present to that type of personality—the "shut-in personality"—which he has defined as being particularly prone to develop dementia præcox.[3] In a more recent study Reiss has arrived at similar conclusions:[4] "Upon a survey of the whole material which has been at my disposal, I find as a general fact that in cases of happy disposition manic states, while in those of pronounced depressive disposition the sad melancholy states predominate."

The *age* at which the first attack occurs is not constant. In most cases it is before the twenty-fifth year, in some before the tenth, and in others after the fiftieth. Quite frequently in women the disease appears with the onset of menstruation or with the first pregnancy.

Diagnosis.—The principal elements of diagnosis are:

[1] C. B. Davenport. *Inheritance of Temperament.* Washington, 1915.

[2] Journ. of Nerv. and Ment. Dis., Apr., 1909.

[3] See p. 259.

[4] Eduard Reiss. *Konstitutionelle Verstimmung und manisch-depressives Irresein.* Zeitschr. f. die gesamte Neurol. u. Psychiatrie, Vol. II, p. 600, 1910.

psychic paralysis associated with the special symptoms of exaggerated mental automatism, which have already been described; absence of mental deterioration; recurrency of the attacks with *restitutio ad integrum* after each.

We differentiate:

General paralysis by the mental deterioration, a certain degree of which persists even during the remissions; the physical signs; and lumbar puncture findings;

Involutional melancholia by the intense and persistent psychic pain, which is much more marked than in the depressed form of manic-depressive psychoses;

Acute confusion by its special etiology, and by the much more marked disorientation;

Delirium tremens by its specific hallucinations;

Dementia præcox by the rapid and pronounced diminution of affectivity, by catatonic phenomena, and by the absence of flight of ideas even in those cases which closely resemble mania.

Homogeneity of Manic-Depressive Psychoses.—Fundamental Symptoms.—The conception of manic-depressive psychoses is due to Kraepelin and constitutes one of the most important advances in psychiatry. Although the grouping of such apparently different and even opposite pathological states as depression and mania may appear unreasonable on superficial consideration, its legitimacy is nevertheless incontestable and is based on two principal considerations:

(1) The existence of certain *fundamental symptoms* common to all forms, manic, depressed, and mixed.

(2) The *alternation*, regular or not, as the case might be, of the phenomena of *excitement and depression in the same subject.*

(1) *Fundamental Symptoms.*—The symptoms of manic-depressive psychoses can be readily divided into two groups.

The *first group* comprises all the morbid phenomena dependent on *psychic paralysis*, namely: (*a*) weakening of attention; (*b*) sluggish formation of associations of ideas; (*c*) insufficiency of perception; (*d*) pathological indifference.

These symptoms of psychic paralysis are especially prominent in the depressed type. But in mania, though usually masked by phenomena of exaggeration of mental automatism (flight of ideas, motor excitement), they are, nevertheless, also present, as can be readily shown by a careful examination.

Let us consider these symptoms individually.

(a) *Weakening of Attention.*—Abnormal mobility of attention is one of the fundamental symptoms of mania. Yet, as shown in the first part of the book, this is but a manifestation of weakening of attention.

(b) *Sluggish Formation of Associations of Ideas.*—Kraepelin [1] and his pupils have shown by means of psychometry that the acceleration of mental processes in mania affects only automatic processes, voluntary associations of ideas being actually retarded, just as they are in the depressed states.

(c) *Insufficiency of Perception.*—Perception of the external world is inaccurate in depression as well as in mania; but while in the former case the perceptions are often incomplete and are manifested clinically by *uncertainty*, in the latter case automatic associations occur in the place of missing normal ones and give rise to false perceptions or *illusions.* Neither the melancholiac nor the maniac perceives the phenomena of the external world in their true aspect, but the one remains in doubt while the other affirms errors.

(d) *Pathological indifference* also clearly exists in mania as well as in depression. To be convinced of this, it suffices but to recall the perfect serenity with which the maniac receives news of a misfortune in his family which, in the normal state, would profoundly distress him.

Psychic inhibition expressed by the above four symptoms is, therefore, the fundamental and constant disorder con-

[1] *Psychiatrie,* 7th edition, Vol II. p. 504. On the subject of measurement of the rapidity of the associations in the insane, particularly in circular insanity, see also Ziehen's contribution in Neurol. Centralbl., 1896.

stituting the common basis of the diverse clinical types of attacks of manic-depressive psychoses.

The symptoms of the *second group* are dependent, not upon psychic inhibition, but upon exaggerated mental automatism, which so often accompanies it. The principal symptoms of this group are: (*a*) Flight of ideas; (*b*) irritability; (*c*) impulsive reactions; (*d*) delusions and psychosensory disorders; (*e*) fixed ideas and, occasionally, imperative ideas.

All these morbid phenomena are incidental. Their presence or absence modifies the *aspect* but not the *nature* of the attack. Some appear with equal frequency in mania and in depression, namely, delusions and hallucinations. Others are, on the contrary, peculiar either to the one or to the other of these states: flight of ideas, irritability, impulsiveness to mania, fixed ideas to depression. But there is no absolute rule in this respect; we meet with depressed cases with flight of ideas, and with cases of mania in which the delusions are more or less fixed.

(2) *Alternation of Excitement and Depression in the Same Patient.*—The close relationship existing between states of depression and manic states becomes still more evident when, instead of considering a single attack, we make a study of all the attacks of one patient. First of all, it is extremely rare for a patient to have only one attack of mania or of depression in his life. Thus isolated and non-recurring mania or depression is almost eliminated. In some cases, it is true, the attacks are always manic, while in some others they are always depressed. These two groups apparently separated by an unfathomable abyss, are in reality connected by a much larger group of double, alternating, circular, and irregular forms, which establish an insensible transition from the one to the other. Moreover, a close study of cases shows that the majority of attacks presenting the manic type or the depressed type are in reality attacks of double form. In fact, on careful inquiry we find that almost constantly manic symptoms are preceded

by a prodromal period characterized by more or less marked depression; again, we often find an attack of depression to be followed by a state of excitement which cannot be attributed to any known cause, not even to the patient's prospect of returning to his usual mode of life in the near future. Thus all attacks of mania and of depression contain in a rudimentary form the elements of excitement and of depression. Circular psychoses thus become the prototype from which the other types are derived.

The above considerations show us that, in spite of the apparent diversity of the symptoms, mania, depression, and their various combinations are not to be considered, as heretofore, as different morbid entities, and that the following conclusion arrived at by Kraepelin is perfectly justifiable:

"The diverse forms which have been described are but *different manifestations of one and the same fundamental pathological process, equivalents*, like the many forms assumed by epileptic paroxysms."[1]

Treatment.—For the treatment of the symptoms which may arise in the different phases of manic-depressive psychoses the reader is referred to Chapter VIII, Part I, of this MANUAL.

As to the problem of prevention of recurrency it is important to insist on abstinence from all alcoholic beverages. A single drink of whiskey has been known to act as the undoubted cause of an attack in a manic-depressive individual, and there are some cases in which most of the attacks are attributable to over-indulgence in alcohol.

An attempt has been made by Kohn to prevent the recurrency of attacks in cases in which the outbreaks are brief and frequent and occur with such regularity that the date of their onset can be predicted with more or less accuracy. In such cases, beginning several days before the expected attack, the patient is given from 12 to 15 grams

[1] Kraepelin. *Psychiatrie*, 7th edition, Vol. II, p. 558.

of sodium bromide daily until the "danger period" is over, when the dose is gradually diminished and the drug finally discontinued. It seems in some cases possible to prevent the outbreaks of excitement by this method of treatment.

§ 5. Chronic Mania

The diagnosis of chronic mania was at one time one of the most common in psychiatry. To-day there can be no doubt that many cases formerly thus labeled belong to excited forms of dementia præcox, particularly catatonic excitements: many, but not all. Chronic mania, though rare, certainly infinitely more rare than was believed by older authors, constitutes none the less a reality. Cases exist presenting all the symptoms characteristic of the manic state—flight of ideas, excitement, morbid irritability, pressure of activity, etc.—and in which these symptoms, instead of being intermittent, become established in definitely chronic fashion.

Chronic forms are seen chiefly in elderly subjects, after the age of fifty. It is exceptional for a chronic manic state to be installed as such from the beginning. More often it follows one or more acute attacks. The patient has one, two, three attacks from which he recovers completely; then comes on another attack in every way resembling the previous ones; the excitement subsides somewhat, periods of relative calm occur at intervals; recovery seems to be approaching, but the condition continues indefinitely and it finally becomes apparent that the acute maniac has become a chronic maniac. At times the chronic state is marked by extreme weakness of attention; this was observed in the following case, the history of which we shall cite briefly, and which may serve as a general type:

Mrs. C. J., two of whose cousins are insane, was born in 1844. In 1869, that is, at the age of twenty-five years, following a confinement, she had an attack consisting of a period of depression and one of excitement, the whole attack lasting eighteen months. She recovered

and remained well until 1891, when, without apparent cause, she had a similar attack from which she recovered at the end of two years, following a surgical operation upon the uterus. In 1901 a third attack: period of depression lasting several months, later, following a trip on which she was taken for diversion, sudden appearance of the manic state. Another surgical operation upon the uterus was tried, but without any result. Since 1901 excitement, flight of ideas, and logorrhœa have persisted with intervals of lucidity which gradually became rarer and shorter. These intervals, which at first lasted several days, have not lasted longer than one or two hours during the first half of 1908. At the present time (September, 1908) they hardly exceed half an hour and, as already stated, they are notably more rare than during the first year of the disease. Moreover, even in the moments of lucidity which still occur from time to time, a certain degree of mental deterioration is observed. Affectivity is reduced, recollections are lacking in precision, attention is fixed with some difficulty, and orientation of time is defective. There seems to be no doubt that we are here dealing with a state of chronic mania with slight mental deterioration. The most pronounced disorder, the one which especially characterizes the case in question and distinguishes it from ordinary manic-depressive cases is an extreme weakness of attention, a weakness which is out of all proportion to the motor excitement, and which makes it impossible to obtain a sensible reply even to the simplest questions, while at the same time it is easy to obtain relative psychomotor calm, sufficient, for instance, to keep the patient seated in a chair.

CHAPTER VII

INVOLUTIONAL MELANCHOLIA

THE essential cause of this disease seems to be bad heredity. Among other factors those most frequently mentioned are grief and stress. Occurring chiefly after forty-five years of age, it seems to be in some way connected with the phenomena of organic retrogression beginning at this age; hence the name "*involutional melancholia.*"

The prodromal period, which is almost constant and usually very long, indicates a profound, slow, and progressive change of the entire organism: the process of digestion is painful; there are anorexia, insomnia, irritability, unwarranted pessimism, and a tendency to rapid fatigue.

Finally the disease sets in, characterized from the beginning by intense *psychic pain*.

It presents itself with the train of physical and psychic symptoms already studied in connection with active depression. When associated with anxiety it gives rise to *anxious melancholia*.[1]

The anxiety may result either in *agitation* (*melancholia agitata*) or in *stupor*. In the latter case the patient appears as though dumbfounded by the pain. "A frightful internal anxiety constitutes the fundamental state, which torments him almost to suffocation."[2]

When the psychic pain is very marked, it entails sometimes a certain degree of *mental confusion* which is most

[1] Capgras. *Essai de réduction de la mélancolie à une psychose d'involution présénile.* Thèse de Paris, 1900.—Kraepelin. *Lehrbuch der Psychiatrie.*

[2] Griesinger. *Loc. cit.*, p. 292.

frequently transitory and subject to the same fluctuations as the pain itself of which it is a manifestation.

In cases of slight or moderate intensity *lucidity* is perfect and sometimes permits the patient to analyze his case with considerable minuteness.

Association of ideas is sluggish, less so, however, than in the depressed form of manic-depressive psychoses. We have seen, in fact, that the intensity of psychic inhibition is inversely proportional to that of psychic pain; accordingly the inhibition occupies here a secondary position. Between the cases in which the sadness clearly predominates and those in which the inhibition is the principal feature, there is a host of intermediary forms which establish an insensible transition between involutional melancholia and manic-depressive psychoses. These two affections seem to be closely related, and borderland cases are not uncommon.

The recent study of Dreyfus[1] indicates clearly that the relationship between involutional melancholia and manic-depressive psychoses is, indeed, a close one. This study consists in a careful investigation of the entire subsequent course of all cases admitted to the Heidelberg clinic since 1892 and classified as involutional melancholia. The facts revealed by the investigation are: the great majority of the cases which had not terminated in death through some complication resulted in complete recovery; in a small percentage of the cases deterioration ultimately occurred apparently on a basis of cerebral arteriosclerosis which such cases seem to be particularly prone to develop; more than half of the cases had more than one attack; in many cases manic symptoms were observed: fleeting euphoria, irritability, loquaciousness, flight of ideas, etc. These results led Dreyfus to the conclusion that involutional melancholia was but a special mixed form of manic-depressive psychoses and Kraepelin, in a preface contributed to the work of Dreyfus, evidently accepts this conclusion

[1] *Die Melancholie ein Zustandsbild des manisch-depressiven Irreseins.* Jena, 1907.

in the following words: "Thesc results show, at least for the main bulk of the cases which we have designated as involutional melancholia, that there is no longer any basis compelling their separation from manic-depressive psychoses."

Thus it would seem that the autonomy of involutional melancholia as a separate clinical entity is destroyed. We have, however, allowed the description of it in this MANUAL to remain, partly for the reason that it still figures in hospital statistics, but mainly for the reason that, admitting its kinship to manic-depressive psychoses, it nevertheless presents special and characteristic features, among which may be mentioned its frequent development following actual depressing causes (death of a near relative, financial ruin); its grave form characterized by long duration (in many cases over five years, in some over ten years), frequent fatal termination; combinations of symptoms not commonly observed in typical attacks of manic-depressive psychoses; the occurrence in nearly half of the cases of only one attack during the life of the individual.

The sadness may in itself become a cause of psychic inhibition and create melancholia with stupor.

To these psychic phenomena are added physical disorders most of which have already been considered:

Respiratory and circulatory disturbances which are dependent upon the depression and anxiety.

Disturbances of digestive functions; anorexia, dyspepsia, painful digestion, constipation.

Impairment of the general nutrition, changes in the composition of the urine (diminution of urea, slight albuminuria), and rapid loss of flesh. The latter symptom is of particular importance; a rise in weight usually indicates beginning convalescence.

The menses are usually suppressed. Their reappearance has the same prognostic significance as the return of the normal weight; it indicates the approach of recovery.

Finally, there are various nervous troubles: headache, palpitation, tremors, hysteriform crises, and insomnia.

These are the fundamental symptoms of involutional melancholia in its simplest form and uncomplicated by delusions. This form is rare; generally the disease assumes one of the following two forms, or some combination of the two: *anxious melancholia* and *delusional melancholia*.

Anxious Melancholia.—The psychic pain, which is here very intense, manifests itself by the mental and physical symptoms of anxiety, which have already been described in the first part of this book: more or less complete cessation of mental processes, in some cases a certain degree of mental confusion at the time of the paroxysms of anxiety; an extremely distressing sense of constriction generally localized in the precordial region or in the throat, less often in the head; pallor and pinched expression of the face, coldness and cyanosis of the extremities, irregular and shallow respirations; lowering of blood pressure; small, compressible pulse, either rapid or slow; dilatation of the pupils.

From the point of view of the reactions anxious melancholia is characterized either by agitation or by stupor.

The *agitation* of melancholia presents the appearance of despair: the patient wrings his hands, strikes his head against the walls, and gives vent to cries and lamentations. It is monotonous and often marked by very pronounced negativism. The phenomena of agitation are sometimes purely impulsive in origin and occur in the shape of sudden attacks which may be very brief. During such attacks the patients may display a tendency to violent acts of danger to themselves or to others (suicidal or homicidal attempts). Such paroxysms constitute the so-called *raptus melancholicus*.

Psychic pain may, like physical pain, paralyze more or less completely all mental functions. Thus is explained the manner in which anxious melancholia may become transformed into *stuporous melancholia;* these two forms, seemingly so different, are in reality closely related. The psychic

inhibition which characterizes stuporous melancholia is essentially a secondary phenomenon.

Anxious melancholia sometimes exists in a state of purity, either as agitated melancholia or as stuporous melancholia. Much more often it is complicated by delusions.

Delusional Melancholia.—All varieties of melancholy delusions are encountered in this affection: ideas of culpability, of humility, of ruin, hypochondriacal ideas, and ideas of negation. It is not uncommon for persecutory ideas to occur in combination with the melancholy ideas.

Hallucinations are not frequent. The least rare are, according to Séglas, those of vision and of the muscular sense. Those of hearing, taste, and smell are occasionally met with, while those of general sensibility are altogether exceptional.

Illusions of all sorts are, on the contrary, frequent. They often assume the form of *mistakes of identity.*

Finally, *delusional interpretations* are constant. The patient hears the noise of hammer-strokes in the vicinity and thinks a scaffold is being built for him. He hears the sound of voices in the street and thinks the mob is going to seize and lynch him, etc.

The reactions are usually in harmony with the melancholy state and with the nature of the delusions. Sometimes, under the influence of anxiety which in many cases accompanies the delusions, the reactions assume an exclusively automatic character; it is to be noted that negativism is not uncommon.

The following case illustrates both delusional and anxious melancholia:

Margaret L., fifty-eight years old.—Paternal and maternal heredity: father was alcoholic, died of disease of the liver; mother eccentric, unduly irritable; maternal aunt committed suicide. — The patient has always been nervous and sensitive. She has been, however, of normal intelligence and always attended properly to the work of her home and family. She has two daughters, respectively thirty and twenty-five years old, both normal. Menstruation ceased two years ago.

The mental symptoms began with a state of general depression and discouragement. On being invited to a christening of a little boy she refused to go, giving as her reason that life is a burden and that there is no cause for rejoicing in the birth of a child. After several weeks she began to show very marked uneasiness and a little later delusional interpretations. She saw wagons passing by the house loaded with various objects, furniture, bedding, barrels, sacks of flour; she heard the drivers cracking their whips; all this alarmed her greatly and she asked her husband whether all this did not signify that she was to be thrown out of the house and left to starve to death. She noticed also that the neighbors looked at her queerly whenever she met them. At the same time physical symptoms appeared: complete loss of appetite, headache, insomnia. About two weeks later, namely, March 20, 1900, she developed an idea of self-accusation. About twenty-five years ago she lost a little daughter from croup. Did not this child die because its mother had left it one day with its feet wet? This idea at first had the character of an imperative idea; the patient knew it was false and tried to drive it away; it, however, grew more and more dominating and was finally accepted by the patient as true: the *imperative idea* had become a *fixed idea*. The psychic pain increased steadily. New delusions sprang up, the first one, however, still remaining active. On April 12 the patient went to the police headquarters carrying a bundle of clothing; this, she said, was for the poor girls who had been robbed of everything and thrown out in the street. At the same time she begged the police authorities to send men to protect those unfortunate women whom the Prussians were about to ravish.

On being taken to a sanatorium she did not cease to wail and to lament, first accusing herself, as formerly, of the death of her little girl, later of the illness of her husband, who really did have heart trouble. Gradually the delusions grew. She claimed she had brought upon her relatives such disgrace and misery that they all committed suicide; the letters which she is supposed to receive from them are false; no doubt this is done to console her; everybody has been too good to her; such a nasty creature should have her head chopped off. There she is, well fed and housed, and warmly dressed, yet they know well that she has no money to pay for all this. But this cannot last; pretty soon the day will come when they will put her out to go and beg. She developed a few hallucinations of sight, of hearing, and of muscular sensibility: several times she saw before her a pool of blood; also several times she heard the voices of her children crying: "Bread! Give us bread!" Finally she complained of an inner voice coming from her breast, which made her say against her own will: "Slut! slut!" She cried loudly, begging to be put to death; has made repeated attempts to commit suicide; from April 21 to October 30 five such attempts were counted, three of which were by hanging.

For a time she refused food; after being tube-fed for two days, she began to eat again, although with much difficulty.

Considerable emaciation. Tongue coated. Breath very foul. Constipation. Slight trace of albumen in the urine.

Such is the fundamental and habitual state of the patient. The anxiety, without being ever entirely wanting, presents, however, periods of exacerbation, so that the patient at times shows the typical picture of anxious melancholia. During such paroxysms the patient seems to be literally suffocating. She seems to be striving to throw off a weight from her chest; she pulls her hair, strikes herself in the face, and scratches at the walls of her room until her fingers bleed. When her agitation is at its height it is impossible to obtain from her a response to any question. She merely utters inarticulate cries or repeats in a low, scarcely audible voice: " My God! . . . My God! . . . " Her consciousness is then evidently profoundly affected and it seems that even delusions at such times disappear under the influence of the psychic pain and anxiety.

Toward the latter part of November, 1900, the general condition of the patient improved. Her appetite became better. The delusions persisted and the patient continued her lamentation, but the reactions became less pronounced. Little by little the delusions also became less active. A certain degree of mental activity returned. Toward the middle of December the patient was able to do some manual work. She returned home, completely cured, February 6, 1901. At the present time (1905) she is still perfectly well.

Prognosis.[1]—Melancholia may terminate in:

(*a*) Complete *recovery*, 67%;

(*b*) *Dementia* due to the development of cerebral arteriosclerosis, 8%;

(*c*) *Death*, 25% which may be due to:

(I) *Suicide*, which is the more likely to occur the more pronounced the psychic pain and the less marked the inhibition. The melancholiac may commit suicide at any period of his illness, even during convalescence, when on account of a real or fictitious gaiety, supervision over him is relaxed;

(II) *Melancholic wasting*, the principal factors of which are intense sadness, anxiety, agitation, sleeplessness, and insufficient alimentation occasioned by a poor condition of the digestive tract, a delusion, or a suicidal idea;

[1] Dreyfus. *Loc. cit.*, p. 269.

(III) Some *complication* the occurrence of which is favored by the defective nutrition of the tissues: pneumonia, influenza, tuberculosis.

The *duration* of the affection is very variable, from several weeks to a few years.

Treatment.—The principal indications are:

To watch the patient with a view to the prevention of suicide;

To support his strength;

To calm agitation if there is any;

To pay special attention to the alimentation.

The first three indications are admirably fulfilled by rest in bed.

Forced alimentation is often necessary to fulfill the fourth.

Psychic pain may be efficaciously combated by the administration of opium in increasing doses. One may start with 15 minims of the tincture per day, increase to 60 minims or more, and then gradually reduce the quantity to the initial dose before discontinuing the treatment.

Finally, continuous warm baths may be of service in the agitated forms.

CHAPTER VIII

PSYCHONEUROSES

HYSTERIA—NEURASTHENIA—PSYCHASTHENIA

§1. Hysteria

Many conditions with which psychiatrists have to deal demand a certain broadening of the traditional conception of disease—that of some morbid material or influence engrafted upon the organism. Among such conditions are mental deficiency and constitutional psychopathic states. Among them also is hysteria, which, far from being a disease in the traditional sense, is essentially mere simulation or assumption of disease or disability without organic basis—a special type of anomalous behavior.

The manifestations of hysteria are varied, the only limit to their variation being the limit of the ability to produce them by an effort of the will (conscious or unconscious). Accordingly such manifestations as elevation of temperature, muscular atrophy, abolition of knee jerks or pupillary reflexes, heart murmurs, etc., do not occur in uncomplicated hysteria.

It would, therefore, be to no purpose to describe the clinical manifestations of hysteria. Some may be mentioned, however, as being among the most common: convulsions, tremors, paralyses, contractures, areas of hypo-æsthesia or anæsthesia, mutism, aphonia, deafness, amaurosis, amnesia, psychotic episodes, etc.

In ordinary times hysteria is seen more frequently in women than in men; but during the World War of 1914–1918 a great many cases occurred in soldiers and there

was an unprecedented opportunity of observing them under conditions which forced into view their underlying psychic mechanism. These cases correspond perhaps most closely to the traumatic hysteria of peace times; but it is probable that they do not differ essentially from ordinary hysteria occurring independently of trauma.

The following presentation is based mainly on war experiences. A brief restatement, however, of pre-war current conceptions will be given first.

Charcot's conception of hysteria was that of a disease entity. This led to a preoccupation with symptomatology, differential diagnosis, clinical definition, and largely remained on a descriptive level.

Möbius saw in hysteria not a disease entity, but a biological trait characterized by a special type of reaction. "For him every one was more or less hysterical. Every one has hysterical small coin in the bank of his personality." [1]

Janet's contribution consists essentially in the theory of subconscious mental processes. An idea or a group of ideas may operate somewhere beneath the threshold of consciousness, i.e., without the subject being clearly or at all aware of them; and they may operate so effectively as to largely control the conduct of the subject.[2]

Further progress in the analysis of hysterical mechanisms is due to Freud.[3] He attempts an explanation of the phenomenon of splitting or doubling of personality to which Janet had called attention. Ideas or complexes of ideas are lodged in the region of the subconscious not at random but by a purposeful functional process, which he terms *repression*, by reason of being charged with painful affect. The important part played by affect in the etiology of

[1] Smith E. Jelliffe. *Hysteria.* In *Modern Medicine.* Edited by Osler and McCrae, Vol. V.

[2] P. Janet. *The Mental State of Hystericals.* English translation by Caroline R. Corson. New York, 1901.

[3] S. Freud. *Selected Papers on Hysteria.* English translation by A. A. Brill.

hysteria had long been sensed and had been in particular insisted on by Binswanger. Freud's experience has led him, moreover, to assume the universality of *a sexual origin* of the repressed complexes underlying hysterical manifestations.

"The final principle of the Breuer-Freud hypothesis is the principle of *conversion.* The strangulated affect, the unreacted-to emotion, belonging to the disassociated state which has been repressed, finds its way into bodily innervation, thus producing the motor phenomena of hysteria. In this way the strong idea is weakened by being robbed of its affect—the real object of conversion." [1]

In one respect Freud's conception is comparable to the older one of Möbius, for Freud, too, does not regard hysteria as a sharply defined disease entity, but rather as an exaggerated condition of a mechanism which in lesser degrees is operative in normal minds.

There remains to be mentioned the contribution of Babinski [2] which has largely dominated the French and some other schools not only in pre-war years, but even through the war, having apparently survived the light of the great mass of newly added experiences.

The essence of Babinski's contribution consists in an attempt to isolate from the heterogeneous material traditionally thrown together under the heading of hysteria the elements of which it is composed. An application of more careful diagnostic technique has enabled him to eliminate, to begin with, organic cases; further he would eliminate emotional disorders and reflex disorders, leaving a more restricted hysteria to which he has applied his newly coined term *pithiatism.* For him hysteria, in this restricted sense, consists in manifestations which are brought into

[1] W. A. White. *Current Conceptions of Hysteria.* Interstate Med. Journ., Jan., 1910.

[2] Babinski. *Démembrement de l'hystérie traditionelle. Pithiatisme.* Semaine médicale, Jan. 6, 1909.—Babinski and Froment. *Hystérie, pithiatisme et troubles réflexes.* Paris, 1916.

existence by the influence of suggestion and the cure of which takes place by persuasion; the characteristic feature of the hysterical personality is abnormal suggestibility.

Perhaps the most significant point insisted on by Babinski is the necessity for distinguishing true hysteria from simulation, especially where the latter manifests itself in characteristically hysterical phenomena—paralyses, contractures, anæsthesia, etc. The result of treatment by persuasion here becomes the basis of the differentiation: if persuasion fails to cure the case is not hysteria but simulation.

Heredity and Constitutional Make-up.—Of 100 cases of hysteria observed in soldiers in the U. S. Army Hospital for War Neuroses at Plattsburg Barracks, N. Y., there was a neuropathic family history in 64, a negative family history as regards neuropathic conditions in 35, and data unascertained in the remaining case. In the same group of cases it was found that there was a history of social maladjustment in some form prior to enlistment in 51 cases, a negative history as regards social maladjustment in 47 cases, and history unascertained in 2 cases. As evidences of neuropathic heredity were counted cases in the family of epilepsy, fainting spells, sick headache, insanity, feeblemindedness, alcoholism, criminalism, eccentricities, temperamental anomalies, nervous breakdown, etc. As items of social maladjustment were counted the following data in the personal history: poor progress in school, poor showing in work, intemperance, criminalism, etc. In 77 out of the 100 cases there was either a neuropathic family history, or a history of social maladjustment in the individual, or both. Thus, it would seem that hysterical phenomena arise on a basis of neuropathic constitution.[1]

Etiological Factors other than Heredity.—In the early months of the war medical writers mentioned physical and psychic factors in the etiology of hysteria more or less

[1] A. J. Rosanoff. *A Study of Hysteria Based Mainly on Material Observed in the U. S. Army Hospital for War Neuroses at Plattsburg Barracks, N. Y.* Arch. of Neurol. and Psychiatry, Oct., 1919.

indiscriminately. Gradually, as the distinction became clear between true cerebral concussion and hysteria, the view gained ground that physical factors, as such, played no part in the etiology of the latter.

In studying the etiology of war neuroses it would seem important to distinguish the acute emotional disorders observed at the front from hysteria. This distinction has been perhaps most clearly drawn by Léri, whose experience extends over the entire duration of the war and who, in that time, had opportunities of seeing cases at the front, in field hospitals, and in neuro-psychiatric centers in the interior.[1]

Many writers have shown a tendency to confound emotional with hysterical disorders. But according to Léri it is a mistake to think that hysterical manifestations are an integral and necessary part of the emotional syndrome. They can appear independently of all emotion; and the emotional syndrome has nothing in common with hysteria.

It seems that the psychic factors to which war neuroses in general have been attributed—fright caused by danger from projectiles, horrifying sights, etc., play a part only in the acute emotional syndrome; hysterical phenomena are not directly produced by them.

I come now to the consideration of a factor which, though seldom frankly avowed by patients and seldom definitely established by clinical investigation in individual cases of hysteria, yet has made itself clearly apparent to many observers in all armies. Speaking for myself and with special reference to my war experience, I would say that this factor has obtruded itself on my attention until I have come to regard it as the mainspring of hysterical conduct.

This factor consists in *a concealed, illicit, morally untenable motive.*

The motive is not always the same, but it is always characterized by the above mentioned qualities. Its most frequent variations are: (1) To evade the law of conscription. (2) To procure, upon reporting for physical examination at a

[1] A. Léri. *Commotions et Émotions de Guerre.* Paris, 1918.

training camp, rejection for physical unfitness. (3) To evade dangerous, disagreeable, or difficult duty, or to evade all duty. (4) To procure the ease and privileges of hospital care. (5) To procure discharge on certificate of disability. (6) To procure compensation for disability.

That illicit motive and it alone, and not shell concussion, war strain, emotional shock, etc., is the factor which actuates hysterical conduct is further shown by three groups of facts of the highest significance.

In the first place are to be mentioned the cases of hysteria arising in the domestic training camps, i.e., thousands of miles from the seat of war. In every National Army cantonment cases came to light often on the day of reporting for military duty, more often early in the course of training—at any rate before any "war strain" could possibly have made itself felt. These cases presented all the manifestations of hysteria which, when seen in overseas cases, have so often been attributed to "shell shock."

In the second place is the striking fact that among prisoners of war who have been, like other soldiers, exposed to shell fire, strain, etc., scarcely any cases of hysteria or other psychoneuroses have been observed.[1]

In the third place is the very common experience of quick and complete recovery from hysterical symptoms upon evacuation to a base hospital, followed by a return of the symptoms in the same or even a greater degree of intensity or by development of new symptoms upon any prospect arising of being sent again to duty. Many of the overseas cases have furnished such a history. The relapse has generally occurred either on the way from the hospital to a re-classification camp or shortly upon arrival at such a camp. Sometimes no cause is given for the relapse, at other times a trivial cause.

[1] F. Lust. *Kriegsneurosen und Kriegsgefangene.* Münch. med. Woch., Dec. 26, 1916. Abstracted in Journ. Am. Med. Assn., Feb. 24, 1917.—R. Gaupp. Discussion of War Neuroses, cited in *Berlin Letter.* Journ. Am. Med. Assn., Feb. 24, 1917.

Psychic Mechanisms underlying Cures.—The viewpoint advanced here with reference to the mechanism of hysteria is borne out not only by the conditions under which the disabling symptoms arise, but also by the conditions under which they disappear. Various methods of cure have been in vogue and all have their advocates and opponents: rest, work, massage, electricity, chloroform anæsthesia (for deaf-mutism), hypnotism, vocal exercises, psychoanalysis, etc.

I am able to report from my own experience that the particular method of therapy is a matter of comparatively little importance in the cure of hysterical manifestations. The mechanism of cure readily reveals itself when studied in the light of the above discussed mechanism of etiology. One or more of the following factors are frequently seen to be operative in cures: (1) An attitude on the part of medical officers impressing patients in such a way as to preclude any hope of successful imposition. (2) Demonstration of the unreal nature of the disability. (3) Strict discipline as opposed to sympathy, coddling, or humoring. (4) Painful or otherwise disagreeable features of treatment. (5) Removal of motive, actuating the symptoms, by change in situation. These factors deserve somewhat detailed discussion.

The first mentioned factor is all important for the prevention of hysterical manifestations and for their suppression in the earliest stages. " In the army in which we had the direction of the neurological center we have had the satisfaction of seeing the number of ' nervous seizures ' diminish from the time the rumor was spread—through soldiers who had returned to their organizations without permission—that with us ' the seizures were not in good repute and were regarded rather with disfavor.' As to mutism and deaf-mutism, we have seen them arise in certain armies in the form of veritable little epidemics, whereas in others they were almost unknown." [1]

[1] A. Léri. *Commotions et Émotions de Guerre.* Paris, 1918.

As to the second factor—demonstration of the unreal nature of the disability—it is plainly operative in the cures of aphonia and mutism by means of general anæsthesia and of paralyses by means of strong electrical stimulation. Patients dread being detected in the act of simulation and therefore yield to " the treatment " rather than allow it to appear too clearly that they are able to phonate, talk, or move their limbs and yet will not do so. " The administration of ether for the cure of functional deafness and functional loss of voice has always in our hands proved satisfactory. It is essential that the loss of consciousness be slight, and that the patient be suddenly roused so as to realize that he is speaking or hearing." [1] The principle involved in the cure of paralyses and anæsthesias by electricity likewise consists in surprising or forcing the patient into betraying by an involuntary movement the functional integrity of both motion and sensation.

The third factor—strict discipline—is unanimously insisted on by all who have had cases of war hysteria to treat, although they have so widely disagreed on other points.

The fourth factor—painful or otherwise disagreeable features of treatment—very often succeeds where others have failed. " Prof. Otto Schultze (Münch. med. Woch., Sept. 19, 1916), who published a review of the reception the Kaufmann system (painful electric shocks) has been given by the medical profession in Germany, admits that it has been stigmatized as inhuman, although it does not, he thinks, inflict pain very different from that which a woman in labor suffers. At his nerve hospital he found the ordinary methods of treating hysterical motor disturbances unsatisfactory, whereas the adoption of Kaufmann's system led to far better results. Before practicing the Kaufmann system he relied mainly on the peaceful atmosphere of his mountain hospital, on good food, rest in bed, kindly treatment, the ignoring of symptoms, and the use of sedatives

[1] A. N. Bruce. *The Treatment of Functional Blindness and Functional Loss of Voice.* Rev. of Neurol. and Psychiatry, May, 1916.

and hypnotics. In 54 cases thus treated marked improvement or recovery was obtained in 4 only; but out of 15 patients treated on Kaufmann's lines 13 benefited appreciably." [1]

The fifth factor—that of removal of motive, actuating the symptoms, by change in situation—is the most effective and theoretically the most significant one. The cases which were sent to the Plattsburg hospital from overseas were for the most part those which had proved most refractory to treatment in hospitals in France. Yet a great many of them had recovered spontaneously at the time they reached Plattsburg; and there was an outbreak of spontaneous cures following the signing of the armistice. This experience is analogous to the peace-time traumatic hysteria. "The hysteria observed in litigants is provoked not by trauma, not by fright, but is the direct result of the psychology of compensation; namely, of the recognition by the plaintiff that the success of his claim for compensation depends upon the existence and persistence of symptoms. For this reason treatment, no matter of what character, is without avail. The plaintiff neither gets well nor improves, and this situation may continue indefinitely, sometimes for years; indeed so long as any hope of settlement persists in the plaintiff's mind. However, all medical attendance ceases with settlement. The symptoms disappear, the plaintiff forgetting all about them. The immediate absence of the plaintiff from physicians' offices and hospital clinics, the moment the money has been paid him, is one of the notorious and striking facts of compensation hysteria." [2]

Relationship between Hysteria and Malingering.—This brings us to the question of the relationship between hysteria and malingering. Opinions differ as to when a diagnosis of hysteria should be made and when one of malingering would

[1] *Disciplinary Treatment of Shell Shock.* (Notes from German and Austrian Journals.) Brit. Med. Journ., Dec. 23, 1916.

[2] F. X. Dercum. *Rest, Suggestion in Nervous and Mental Diseases.* Philadelphia, 1917.

be justified. Yet even those who hold opposite views are agreed as to there being a close similarity in the clinical manifestations of the two conditions and as to there being great difficulty in establishing the differentiation in practice. "Nothing, it may be said, resembles malingering more than hysteria; nothing hysteria more than malingering. In both alike we are confronted with the same discrepancy—between fact and statement, between objective sign and subjective symptom—the outward aspect of health, seemingly giving the lie to all the alleged functional disabilities. . . . We may examine a hysterical person and a malingerer—using exactly the same tests—and get precisely the same results in one case as in the other. The finer the methods that we employ to test the genuineness of their complaints, the reality of their objective phenomena, the more do they—in hysterical individuals—yield results which in a non-hysterical person would be held as proof of positive deceit. In short, anyone who has had much experience of hysteria comes inevitably to the following conclusion: tests for malingering holding valid with reference to organic diseases are invalid in reference to hysteria." [1]

The motives enumerated above as constituting the mainspring of hysterical conduct are the same as those which students of malingering have uniformly reported as actuating their cases.[2] Also the manifestations described by students of malingering are exactly the same as those observed daily in hysteria. Jones and Llewellyn, for instance, describe the following: pain, hyperæsthesia, anæsthesia, analgesia, limping gait, tremor, contractures, paralysis, epileptiform seizures, amaurosis or amblyopia, contractions of the visual field, deafness, aphonia, stuttering, mutism, deaf-mutism, etc.

A search through the literature reveals but one point to

[1] A. B. Jones and L. J. Llewellyn. *Malingering.* Philadelphia, 1918.

[2] Pearce Bailey. *Malingering in U. S. Troops.* The Military Surgeon, March and April, 1918.—Jones and Llewellyn. *Loc. cit.*

which the differentiation is fastened almost unanimously, namely, *the conscious or unconscious quality of the motivation.* Yet even on this point writers have shown much inconsistency; for it is admitted that malingering, as well as hysteria, may be subconscious or unconscious.[1] But there is more to add to the confusion. A case, it is said, may begin with conscious deception and end with unconscious self-deception; or *vice versa;* or there may be a mixture of unconscious and conscious simulation, i.e., hysteria complicated with malingering; or there may be a condition half-way between conscious and unconscious simulation.[2]

It is strange that so futile a consideration, one so obviously belonging to the domain of metaphysics and not science, as the question of degree of consciousness of a mental process, should become the preoccupation of scientific men and should be chosen as a criterion of clinical diagnosis! When we are dealing with weak-minded, emotionally unstable, morally defective individuals, such as hysterics and malingerers are; and when, moreover, the question is one of "conscious" or "unconscious" *deception,* it is all the more amazing that a criterion, which is, in the first place, vague, and, in the second place, purely subjective, should seriously occupy the professional mind as a guide in practical work.

Among other points of differentiation between hysteria and malingering which have been suggested are: (1) Results of treatment by persuasion, i.e., if persuasion fails to cure the case is not hysteria but malingering (Babinski). (2) A desire to be cured speaks for hysteria; the opposite indicates malingering. (3) The malingerer dreads examination; the hysteric welcomes it. (4) Hysterical manifestations

[1] B. Glueck. *The Malingerer; a Clinical Study.* International Clinics, Vol. III, Series 25, 1915.—R. Sheehan. *Malingering in Mental Disease.* U. S. Naval Med. Bull., Oct., 1916.

[2] H. Campbell. *War Neuroses.* Practitioner, May, 1916.—W. Harris. *Nerve Injuries and Shock.* (Oxford War Primers.) London, 1915.—A. B. Jones and L. J. Llewellyn. *Malingering.* Philadelphia, 1918.—Pearce Bailey. *Malingering in U. S. Troops.* The Military Surgeon, Mar. and Apr., 1918.

bear the stamp of a certain genuineness which those of malingering lack. These points merit somewhat detailed discussion.

As regards results of treatment by persuasion, it is very generally recognized that in many cases which are by all diagnosed as typical hysteria persuasion fails to cure—so-called refractory hysterics. In other cases, also refractory, a cure is, indeed, obtained by persuasion, but only when it is reinforced with painful electrical treatment (Kaufmann method), isolation on liquid diet, threat of operation or of court martial, etc.

It is true, of course, that many cases of hysteria have readily yielded to persuasion; but the conditions under which that has happened should be taken into account. When the danger was removed of being returned to the front, especially, as already stated, after the signing of the armistice, many cases were not only easily "persuaded," but were cured by any method that happened to be tried, though they had previously proved refractory. The cure in these cases is obviously to be attributed not so much to persuasion as to the removal of the danger, the presence of which had given rise to the symptoms. Some cases have remained refractory even since the signing of the armistice; in these cases the actuating motive is to gain government compensation; that is the reason why the "persuasion" that has cured thousands of others is doing them no good.

Moreover, proved malingering has also in many cases yielded to persuasion, while other cases have proved refractory; in other words, the experience with malingering, in that respect, has been exactly like the experience with hysteria. Of great interest in this connection are the observations of Sicard.[1]

Babinski's differentiating test of cure by persuasion is

[1] J. A. Sicard. *Simulateurs sourds-muets.* Paris méd., Oct. 23, 1915. Abstracted in English by M. W. Brown and F. E. Williams, in *Neuro-Psychiatry and the War*, published by The National Committee for Mental Hygiene, New York, 1918.

based on his general conception, according to which the essential feature of the hysterical personality is abnormal suggestibility. But a close scrutiny of the facts does not support this conception. An equally plausible case might be made out for abnormal *lack* of suggestibility.

Under certain conditions the hysteric is, indeed, remarkably receptive to *certain* suggestions; he is at the same time refractory to others. When he has to play sick in order to avoid dangerous duty he will not only be readily influenced by suggestions unwittingly made by the examining physician in testing for disorders of sensation, etc., but will actually seek suggestions by observing cases of real disease and will develop by auto-suggestion such symptoms as he may imagine to be appropriate for a "dead nerve," "stoppage of circulation," etc. At the same time he is apt to resist any suggestion of cure.

But a time comes, when, upon removal of danger, the situation changes. What was previously a life-saving disability now becomes a nuisance. Although many are, in the new situation, cured spontaneously, others feel that a sudden cure without treatment would but betray the false nature of the trouble. Nothing is more natural than that they should again seek the coöperation of the medical profession to assist them in making a seemly and plausible exit from an awkward situation. And so, after taking electricity, hypnosis, re-education, vocal exercises, or what not, accompanied by "suggestion," they are pronounced cured: this carries with it not only relief from a no longer serviceable disability, such as mutism, paralysis, contracture, etc., but also, by implication, added certification by duly constituted medical authority that a disease had existed.

Turning now to the next point of differentiation, according to which a desire to be cured speaks for hysteria, while the opposite indicates malingering, I am forced to judge from the war experience that no such generalization is possible; in a given case everything depends on special circumstances. This is, in fact, the view held by many com-

petent students of hysteria: "Every practitioner knows the service a nervous illness often is to a patient in dealing with relatives, over whose head the patient holds it almost as a threat; this process may be consciously or unconsciously carried out. Under such circumstances the patient's deep-rooted objection to getting better may defy all therapeutic measures."[1] I have seen cases in which stubborn resistance to treatment gave way, following the signing of the armistice, to an impatient longing to get well.

The next alleged differentiating point, according to which the malingerer dreads examination, while the hysteric welcomes it, is, as far as my experience is concerned, also untrustworthy. In the one case of proved malingering observed by me, in which conviction and sentence by general court martial was obtained, the patient willingly at all times reiterated his story, gave written statements, submitted to neurological examinations in which the areas of anæsthesia were repeatedly mapped out, etc. He was, of course, not told that these examinations had for their object the detection of simulation. Under similar conditions hysterics, too, welcome examination. But I have many times seen hysterics cease to coöperate and become resistive to examination upon a suspicion arising in their minds that the object of the examination was to test the genuineness of the symptoms. This was especially noted in cases of convulsions, in which patients by turning away, biting, struggling, and fighting resisted an examination of the pupils, knee jerks, plantar reflexes, etc.

The last above mentioned differentiating point, according to which hysterical manifestations bear the stamp of a certain genuineness which those of malingering lack, is also not to be relied on. All that can be said is that in both hysteria and malingering one meets with various degrees of adroitness in simulation, various degrees of determination and persistence. "Macdonald tells of a man, feigning epilepsy, who during a fit suffered without flinching knives thrust under his nails, the insufflation of irritating powders into his

[1] E. Jones. *Papers on Psycho-Analysis.* London, 1918.

eyes, and one day fell 30 feet to convince the expert, though finally he acknowledged his deceit." [1]

To sum up: My own experience, much discussion with other medical officers, and a study of the literature, all lead me to the conclusion that *what some have described under the name of hysteria and what others have described under the name of malingering are one and the same thing.* The difference seems to be entirely one of viewpoint. *Hysteria* is an expression which would stress a medical viewpoint. *Malingering* is one which would stress a legal viewpoint.

Sex Factors.—Intrapsychic Conflicts.—There remain two other points in connection with hysteria which merit discussion in the light of the war experiences: (1) the part played by sex factors, (2) the theory of intrapsychic conflicts. Both these points, as all know, have been stressed by Freud and others of his school.

Although Freud's views as to the exact part played by sex factors in hysteria have undergone considerable modification from the time of his original formulation nearly twenty-five years ago, yet even in his more recent formulations the sex element is regarded as essential in the etiological mechanism of hysteria: " The hysterical symptom corresponds to a return to a manner of sexual gratification which was real in infantile life and which has since been repressed."—" The hysterical symptom can assume the representation of various unconscious non-sexual impulses but cannot dispense with a sexual significance." [2]

It seems quite probable that, in relation to a certain variety of clinical material—especially such as would be most likely, in times of peace, to come to the attention of a nerve specialist devoted, like Freud, to psychoanalytic practice—the idea of the universality of sex factors is well

[1] A. B. Jones and L. J. Llewellyn. *Malingering.* Philadelphia, 1918.

[2] S. Freud. *Sammlung kleiner Schriften zur Neurosenlehre. Zweite Folge,* 1909. Quoted by O. Pfister. *The Psychoanalytic Method.* English translation by C. R. Payne, New York, 1917.

founded. The sphere of sex, under ordinary conditions, might even *a priori* be regarded as the main if not the sole source of "concealed, illicit, morally untenable motives" postulated by me as the mainspring of hysterical conduct. But the war experience has shown even to loyal adherents of Freud that hysterical manifestations can be actuated by motives other than sexual. In medico-legal practice, even in peace times, neurologists have seen but too often hysterical manifestations ("traumatic neuroses") arise on the basis of exaggerated claims for indemnity, sick benefit, accident insurance, workmen's compensation, etc., without the intervention of sex motives.

It seems, therefore, justifiable to conclude that an illicit motive is an essential part of the mental mechanism of hysteria; but such motive need not be of a sexual nature, although undoubtedly it very often is.

Turning now to the subject of intrapsychic conflicts, it will be remembered that the manifestations of hysteria are regarded by some as a sort of compromise resulting from a conflict between repressed, subconscious wishes and the patient's conscious tendencies representing the better part of his "split-up personality."

I can confirm, from such observations as I have been able to make, the existence of a conflict. But it has seemed to me to be, for the most part if not entirely, a conflict rather between the patient's desire to shirk, loaf, avoid exposure to danger, gain unearned compensation, etc., and pressure from *external* sources the object of which might be to expose his motives and the unreal nature of his disability, to bring on him the opprobrium of his comrades, to render him liable to legal prosecution, etc. In other words, I was unable, in the great majority of cases, to detect any pricking of conscience, evidences of regret at being a burden rather than a help to their country in its great emergency, any struggle between a nobler and baser parts of self, but rather lack of evidence of the existence of a nobler self in these cases.

This brings us to the subject of the hysterical personality.

The Hysterical Personality.—The family and personal histories of hysterics indicate some sort of relationship to the constitutional psychoses, epilepsy, mental deficiency, constitutional psychopathic states, etc. But the hysterical personality can be more specifically defined. Its essential feature, it seems to me, consists in *a character defect,* which I shall now take pains to describe.

Perhaps it is worth while to point out, to begin with, that in the moral side of our nature three motivating principles can be distinguished, each of which actuates our conduct in a measure which differs in different individuals.

The first of these may be termed *pure or æsthetic morality;* it is represented in the saying, " It is better to be right than to be president." No considerations of selfish advantage, of mere catering to popular taste or demand or to the powers that be, are here permitted to enter. A person actuated by this principle turns away from thoughts of deception, theft, dishonesty, or any other moral filth, just as he might, from inherent æsthetic repulsion, turn away from a foul smell.

The second principle may be termed *prudent morality;* it is represented in the saying " Honesty is the best policy." Unlike the case of the first principle, here considerations of selfishness and personal ambition not only are permitted to enter but are the basis of doctrine. A person actuated by this principle turns away from wrongdoing not from an æsthetic aversion, but because of a conviction that, in the long run at least, it does not pay.

The third principle, *imposed morality,* has its roots in the deterrent force of such measures of redress, retaliation, or protection as are available to individuals and society in dealings with wrongdoers. A person actuated by this principle has no æsthetic aversion to wrongdoing; and he regards the maxim of prudence with cynicism. His preoccupation is mainly how to escape detection, conviction, and punishment. If he refrains from wrongdoing, it is only when the risk involved is too great and too immediate.

I could not better define the hysterical personality, as I

have observed it, than by saying that it is characterized by total lack of the first principle—pure or æsthetic morality; that it is at best actuated by the second principle—prudent morality; and that it is, in its typical manifestations, actuated entirely by the third principle—imposed morality, i.e., in so far as its conduct has any moral quality at all.

This places the hysterical individual in close relation to the criminal. Therein I believe my conception to be correct. Yet a certain difference may be pointed out. Most hysterics are characterized by a trait which is foreign to many criminals: indolence.

A desire to lead a parasitic existence, to be a burden on relatives, employers, the government, to live on a pension and do no work, is characteristic of many of these patients. They would, and often do, steal anything conveniently within reach, lie, cheat, make work and trouble for others, wantonly destroy government property, but they have not the enterprise or energy that some criminals have of planning and carrying out an embezzlement, or a burglary, or a train robbery: that is too much like work.

This description may seem to some much overdrawn. I would, therefore, at this point again call attention to the fact that the above described traits of hysterical personality exist in all degrees. Between the man of highest integrity actuated only by the purest motives of unselfish service, and the one who utterly lacks all moral compunction and is constantly preoccupied with motives of shirking and of organizing a parasitic existence, there are many shades of transition.

It should, moreover, be borne in mind that the material observed in the Plattsburg hospital, on which in the main this account is based, represents, by selection, the most refractory cases of hysteria met with in the army.

§ 2. Neurasthenia

The cases classed under the heading of neurasthenia may be roughly divided into four groups which are superficially very similar to each other but which, on closer study, may be found to be based on wholly different psychio mechanisms: (1) hystero-neurasthenia, (2) splanchnic neurasthenia, (3) sexual neurasthenia, (4) neurasthenic state allied to manic-depressive psychoses.

Hystero-neurasthenia is characterized by vague general hypochondriasis with purely subjective symptoms, without organic basis, and may often be shown to be motivated exactly in the manner of the above discussed hysterical manifestations. It is, to my mind, but a special type of hysteria or simulated disease. It is apt to be seen in individuals presenting the same sort of character defect as that which underlies common hysteria, but better endowed in intelligence and education, more polished and diplomatic, more subtle and plausible. Thus, during the World War, all observers have noted that this condition is relatively more frequent in commissioned officers than enlisted men. My experience has amply shown that the possession of intelligence far above the average and good educational and social opportunities is not incompatible with gross lack in moral sentiment.

Splanchnic neurasthenia is characterized *physically* by general undernutrition, muscular atony, lack of endurance, tendency to become giddy and faint, rather light and restless sleep at night, perhaps troubled with muscular twitchings and jerkings, somnolence during the day, frequent headaches, and various abdominal symptoms referable to visceroptosis which is usually present in more or less pronounced degree: dull pain and tenderness in hypochondriac or iliac regions, poor and capricious appetite, frequent nausea and vomiting, constipation, "gas pains," and occasionally signs of floating kidney or uterine displacements. *Mentally* this condition is characterized mainly by habitual hypochondriasis, i.e., preoccupation with bodily symptoms, disinclination to effort

or exertion, and a resulting general futility, superficiality, and inefficiency.

Sexual neurasthenia occurs more often in men than in women. The patients commonly complain of seminal emissions, premature orgasm upon attempts of intercourse, impotence; they are filled with anxious thoughts of "lost manhood" which they would attribute to masturbation in youth. They allow their minds to dwell almost constantly on their sex function, are self-absorbed and brooding, often bashful and seclusive. They are given to reading quack literature and going to advertising doctors. Many cases would seem to be mild or incipient dementia præcox.

Neurasthenic states allied to manic-depressive psychoses are popularly known as "nervous prostration" or "nervous breakdown" and are characterized by depression, discouragement, difficulty of concentration, feeling of inadequacy, and psychomotor retardation. Often they are accompanied by suicidal tendency.

§ 3. Psychasthenia

Psychasthenia is characterized by obsessions, morbid fears and doubts.

An *obsession*[1] consists in an *imperative idea associated with a state of anxiety, there being no marked disorder of consciousness or judgment.*

We have already studied imperative ideas and learned that they constitute a form of mental automatism.

We have also studied the principal characteristics of anxiety. Its relations to imperative ideas have been much discussed. Westphal, who was one of the first to make a thorough study of obsessions, is of the opinion that the anxiety is *always secondary* to the imperative idea. This

[1] Arnaud. *Su lar théorie de l'obsession.* Arch. de neurol., 1902, No. 76.—Roubinowitch. *Étude clinique des obsessions et des impulsions morbides.* Ann. méd. psych., Sept.–Oct., 1899.—P. Janet. *Les obsessions et l'anasthénie,* 1902, Paris, F. Alcan.

opinion is certainly too absolute, for anxiety may precede the imperative idea and even appear independently of it.

Ribot, Freud, Pitres, and Régis have insisted upon those cases of diffuse anxiety, or *panophobia*, in which the emotion exists independently of any fixed idea.[1]

This question seems to be analogous to that which we have considered in connection with allopsychic disorientation and hallucinations. We are inclined in this case to view with favor a similar solution, namely, that imperative ideas and anxiety are two manifestations of the same fundamental psychic disorder.

Intact consciousness and judgment are, as we have just pointed out, the rule in obsessions; the patient is therefore able to realize the pathological nature of the phenomenon. There are, however, some exceptions to this. The subject has sometimes, when his anxiety reaches its height, a sense of reduplication or of transformation of the personality. One such patient of Séglas' entered a shop " to speak to the clerks, to ask for something and thus to find new proof that she was her real self."

Obsessions are occasionally accompanied by *hallucinations*, chiefly motor hallucinations, which in a manner *exteriorize* the imperative idea.

Obsessions are of various forms. First of all, three great classes are to be distinguished, depending upon the influence which the imperative idea exercises upon the patient: (1) intellectual obsessions, which are unaccompanied by any voluntary activity; (2) impulsive obsessions, in which the idea tends to be transformed into an act; (3) inhibiting obsessions, the action of which tends to paralyze certain voluntary acts.

(1) *Intellectual Obsessions.*—The consciousness of the patient is occupied either by some concrete idea—a word,

[1] Freud. *Obsessions et phobies.* Rev. neurol., 1895.—Manaud. *La névrose d'angoisse. Troubles nerveux d'origine sexuelle.* Thèse de Lyon, 1900.—P. Londe. *De l'angoisse.* Rev. de méd., 1902, Aug.–Oct.

an object, an image of some person or of some scene—or by some abstract idea, often of a metaphysical nature. To the latter category belong the obsessions in which the subject has a feeling that he does not exist, that the external world is formed of nothing but phantoms, etc. The imperative idea is then said to have a negative form. In other instances, without going as far as complete negation, it is expressed by doubt, thus constituting a transitional form between intellectual and inhibiting obsessions.

(2) *Impulsive Obsessions.*—These are very numerous. The following are the principal forms:

Onomatomania: an irresistible desire to pronounce certain words, sometimes obscene words (coprolalia).

Arithmomania: an irresistible desire to count certain objects, add certain figures, etc.

Kleptomania: a morbid impulse to steal objects which are entirely useless, or which the subject can easily pay for.

Dipsomania: an irresistible impulse to drink alcoholic beverages of every description (wines, liquors, eau-de-Cologne, spirits of camphor, etc.), occurring in a person of temperate habits, who may at other times have even a dislike for alcohol. The attacks may recur, and the dipsomaniac may become an alcoholic. He differs radically from the ordinary drunkard, however. "The one is alienated before beginning to drink, the other (the alcoholic) becomes alienated because of his drinking" (Magnan).

Pyromania; Suicidal and Homicidal Impulses:[1] These three obsessions are of equal gravity from a social standpoint and may be placed in the same group. The first consists in a morbid impulse to set buildings on fire; the other two require no definition.

In some cases the patients obey their fatal impulses.

[1] Vallon. *Obsession homicide.* Ann. méd. psych., Jan.–Feb., 1896. —Carrier. *Contribution à l'étude des obsessions et des impulsions à l'homicide et au suicide.* Thèse de Paris, 1900.

Vallon has reported a case of a young man who, having a homicidal obsession, struggled against the impulse, but was finally overcome and yielded.

Such cases, however,. are rare. Usually the patients succeed by various, and at times singular, means in resisting their impulse. Many take flight at the moment of the paroxysm; others request to be restrained or held; still others voluntarily have themselves committed. One patient of Joffroy's, while walking in the street, was seized with the idea of throwing her child under the wheels of a passing car; she entered a wine merchant's shop, placed her child upon the counter and took flight.

Similarly, it is rare for patients to yield to a suicidal impulse. The means they make use of to escape their obsessions are innumerable. A woman possessed by the idea of throwing herself out of the window had all the windows of her house protected with iron bars. Another such unfortunate condemned herself never to cross the Seine river to prevent herself from yielding to the impulse to drown herself.

As to family suicide, it is almost never the result of an obsession, but of a fixed idea which is developed by imitation.

(3) *Inhibiting Obsessions*.—Like the preceding ones, these assume very varied forms.

One of the most frequent is "*doubting mania*." Its characteristic feature is the inability on the part of the patient to affirm a fact or to make a decision.

Many normal persons experience this phenomenon in a slight degree. At the borderland of doubting mania we find individuals who hesitate before mailing a letter, in spite of having already several times verified the contents, the address, the sealing of the envelope, adherence of the stamp, etc.

Doubt is likely to assume the form of *scruples*, so frequent in religious persons: a fear of profaning sacred objects, of not being in a holy state of mind, etc.

Closely related to doubting mania are the *phobias*,

which are usually groundless and sometimes ridiculous; their absurdity is recognized by the subject himself.

Some patients do not dare to touch any object, constantly wear gloves, wash their hands a hundred times daily, etc. This phobia, which includes also the fear of contracting an infectious disease through contact with contaminated articles (*nosophobia*), constitutes "*délire du toucher*."

Others have a fear of being unable to stand up or to accomplish certain movements, such as walking. "In a deserted place, in a very wide street, upon a bridge, in a church, or in a theatre the patient is suddenly seized with the idea that he will be unable to cross the wide space before him, that he is going to die, or that he is going to be sick." [1]

This morbid phenomenon, known as *agoraphobia*, induces a veritable functional paralysis, and the patient may fall if he is not supported. The slightest support is sufficient to calm and reassure him; the origin of the attack is, therefore, purely psychic.

Claustrophobia is the opposite of agoraphobia; it consists of an inability on the part of the patient to remain in a closed space.

Erythrophobia, first described by Pitres and Régis, consists in a fear of blushing. These patients do not dare to attract anybody's attention to themselves, being sure to blush most distressingly. This phobia is closely related to ordinary timidity, of which it is occasionally a complication.

The following case shows a state of *panophobia* or *diffuse anxiety* combined with very pronounced *doubting mania*, manifesting itself by constant uncertainty and by moral and religious scruples. To use the very expressive terminology of Freud, the patient is in a state of permanent anxious anticipation which, at the occasion of the most

[1] Régis. *Manuel pratique de Médecine mentale*, p. 279.

immaterial and trifling occurrences, develops into an attack of anxiety.

Miss Margaret F., forty-three years of age, private teacher. Family history: father alcoholic. The patient is of normal intelligence. Disposition melancholy, but gentle and affectionate. The patient lived for twelve years with the same family, where she had inspired a true attachment for herself. She has had no serious illnesses, save frequent attacks of migraine.

The onset of the illness dates back to the fall of 1903. The young lady whom she had been teaching finished her education, and Miss F. had to take another position. This grieved her very much. She gradually grew sad, depressed, and became disgusted with everything. In *November*, 1903 (seven months after her change of position), she began to have all kinds of doubts: Has she said her prayers properly? Has she not made a mistake in asking the druggist for medicine? Feeling herself to be really ill she left her new position and went home to her parents. Her morbid preoccupations, however, persisted. Her general health was not very good. She lost considerable flesh in a short time. She was taken to a sanatorium on *January* 4, 1904.

An examination made on that day showed the following: Stature slightly below the medium. Constitution normal. No evident organic disease except a slight degree of emaciation. Lucidity perfect. Patient had a very clear realization of her own condition. She showed uneasiness with continuous agitation: walked up and down the room, shifted from one foot to the other, rubbed her hands in a nervous manner, looked around with a sort of apprehension, doing all this, she said, in spite of herself and without any definite idea. A few moments after her arrival doubts and fears made their appearance. She noticed a bottle of syrup on a table in her room. Immediately she began to wonder if she had not, without knowing it, poured something into the bottle, perhaps poison, or ink, or perfume. Later on the same day, also on the days which followed, new fears developed and the doubts increased. The following is a transcript of some of the case notes from the records of this patient.

January 15. Patient, on receiving her mail, could not make up her mind to open it. The nurse opened it for her. The patient is afraid to sort her own linen or clothing. She begs the nurse to examine minutely every piece and to take her oath that no injurious powder has been found on the fabrics or on the bed linen. She knew that she had on her arrival at the sanatorium 121 fr. 75 cms. in her pocket-book, in fact she had written the amount down in her note book, yet she was in doubt. She had the nurse count the money over and finally, still doubting, decided to write to her mother asking whether this was

the correct amount. In the evening she said her prayers, kneeling at the bedside, but insisted on a nurse being present all the time in order that she might have proof later that she said her prayers properly.

January 17. Patient went to mass and had prepared three 10-centime pieces for the collection. But, contrary to her expectation, the collection tray went around only twice; there remained, therefore, one 10-centime piece. She passed the entire day in most painful anxiety, not knowing what to do with the ten centimes, asking herself whether they were really hers, or whether she had inadvertently taken them from the collection tray, or picked them up from a neighboring seat.

January 23. Patient fears she was disrespectful in her remarks to the physician. This is probably due to her being neglected, because no attention is paid to her complaints. But it is also her own fault that she is left to herself: perhaps she has not followed the doctor's advice, as she should have done. If one could only return the past! It may be, too, that she has not always done her duty toward her relatives; in that case her sufferings are but the punishment of heaven. On close inquiry it is found that the patient has no true self-accusations; the patient herself says that there is no real foundation for these ideas, but that they just force themselves upon her mind.

January 29. The patient was seized with fear at the idea of going up to her room alone to find a handkerchief. A nurse had to accompany her.

February 9. Patient decided to go out for a walk in the park; all the time she insisted on holding the nurse's hand, and still had to come back after a few minutes because, she said, she was very much afraid. "Afraid of what?" the nurse asked her. "I don't know. . . . Was there not an accident or a crime in the park several days ago?" In spite of all assurance on the part of the nurse that nothing unusual had happened the patient could not be calmed, but kept asking the physician, his assistant, and the nurse the same question over and over again.

February 15. At the table the nurse emptied a package of vichy salt into a glass of water. The patient was seized with great terror. "What was that white powder?" Vichy salt, they told her. "But has there not been some mistake? Is it not some kind of poison? Have not some particles of it fallen on my plate?" Everybody present assured her that she had no reason to be alarmed, that no mistake was possible, that at any rate her plate was too far for any particles from the package to have fallen on it, but all to no purpose; the entire luncheon hour and the rest of the afternoon was passed by the patient in the same state of anxiety.

February 25. Patient wanted to have all the salt cellars on the table emptied as they might contain something injurious.

February 26. Somebody, in relating a piece of news from the paper, made use of the word "accident." The patient uttered a cry. That was horrible, she declared, such words ought not to be uttered in her presence, they cause her such fear. Later it appeared that there was a whole list of words that she ought never to hear: crime, poison, death, thief, sanatorium, asylum, etc.

March 2. Patient was visited by a friend. She seemed to derive no pleasure from the visit, cried a great deal, and took no interest in the news her friend told her. At the supper table she suddenly remembered that it was a fast day and refused to eat any meat. She was offered some eggs, but hesitated a good half hour before accepting them. For her salvation she ought to be content with some peas. On the other hand, the doctor told her to eat meat, which, in fact, would be better for her health. Further, by taking the eggs would she not be depriving someone? Finally she decided, or rather it was decided for her, to have two boiled eggs. But she did not cease worrying and during the entire evening kept asking herself what she ought best to have done.

March 21. The patient was informed that her relatives had decided to take her home, which she had several times begged them to do. Instead of being pleased she became despondent. This may not be prudent, she is not yet cured, who will take care of her at home?

On the following day she was discharged from the sanatorium, unimproved.

CHAPTER IX

HUNTINGTON'S CHOREA

Huntington's chorea, a constitutional affection in the strictest sense, occurring on a hereditary basis, forms a group apart from and apparently entirely independent of the other constitutional disorders thus far considered. Arrests of development, epilepsy, dementia præcox, paranoia, manic-depressive psychoses, involutional melancholia, hysteria, and allied conditions often enough present a history of similar heredity, but at least as often, if not more so, they present a history of dissimilar heredity, so that we find instances of two or more of them existing in the same family. For this reason it is generally held that these conditions, though forming clinically fairly distinct entities, are nevertheless in some manner related to each other. The case is different with Huntington's chorea. In all cases in which a complete family history has been secured the heredity which was found has been similar. Instances of other neuropathic conditions are, indeed, occasionally observed in the families of patients suffering from Huntington's chorea, but they are relatively so infrequent as to be readily accounted for as coincidences essentially without relationship to the chorea itself.

Another reason for assigning to Huntington's chorea an independent position among the constitutional disorders is the special manner in which it is transmitted by heredity. Such evidence as is available indicates that the neuropathic conditions enumerated above are for the most part transmitted in the manner of Mendelian *recessives.* (See Chap-

ter I, Part I of this MANUAL.) Theoretically, then, the development of a case requires a *convergent* heredity, and in practice such heredity is very frequently found where a complete family history is available; furthermore, the hypothesis of recessiveness offers an explanation of the frequently observed fact of *atavistic* heredity in connection with cases of these conditions. Pedigrees in cases of Huntington's chorea practically never show either convergent or atavistic heredity; even in families heavily charged with this condition an individual who happens to be free from it is also free from the risk of transmitting it to his offspring; in other words this disease does not skip a generation as other neuropathic conditions frequently do. Thus Huntington's chorea, considered as a biologic trait, behaves, unlike the large general group of other neuropathic conditions, not as a Mendelian recessive, but as a *dominant* in relation to the normal condition.[1]

The disease is comparatively rare, yet most institutions for the insane can show one or more cases. Both sexes are about equally affected. The age of onset in typical cases is between thirty-five and fifty. The development is gradual, beginning with slight irregular movements of the face and upper extremities which extend slowly over the rest of the body, at the same time becoming more severe; the movements are almost constant, ceasing only during sleep; the patient's speech becomes affected eventually, growing indistinct and unintelligible. There are no disturbances of sensation. Mental symptoms appear in almost every case sooner or later: "a weakness of judgment and initiative, absent-mindedness, general dissatisfaction with surroundings, a growing selfishness and irritability are among the earliest symptoms observed."[2] The fully

[1] C. B. Davenport and E. B. Muncey. *Huntington's Chorea in Relation to Heredity and Eugenics.* Amer. Jour. of Insanity, Oct., 1916. (Bulletin No. 17, Eugenics Record Office, Cold Spring Harbor, N. Y.)

[2] A. S. Hamilton. *A Report of Twenty-seven Cases of Chronic Progressive Chorea.* Amer. Journ. of Insanity, Jan., 1908.

developed mental picture is characterised by marked irritability, ideas of persecution, and a slow but progressive deterioration; the latter consists mainly in a "disinclination toward mental exertion, which is so pronounced that the examination becomes very difficult; in the marked cases it interferes even with such simple reactions as stating whether it is summer or winter, and seems to give rise to the fact that the patient does not respond at all, or responds in a perseveratory manner; in the milder cases it shows itself in calculation, in giving time relations, and in giving the substance of a simple story read to them, leading to the excuse that the memory is bad, that they are unable to tell it, etc.; whereas, on the other hand, in the orientation, even in the worst cases, there is remarkably little interference; the memory of actual facts, if sufficiently insisted upon, is found to be quite good."[1] In the original description of the disease Huntington mentioned marked suicidal tendency as being very common,[2] and this observation has been corroborated by most of the later writers.

Huntington's chorea is a chronic, slowly progressive, incurable affection. It cannot be said to be in itself fatal, death usually occurring at the end of many years from some intercurrent disease.

While the majority of cases correspond fairly closely to the above description, more or less marked variations from the most common type are frequently seen. The onset may occur at an early age, even in childhood or in infancy, or later than usual, in advanced senility; the symptoms may be mild, consisting of slight movements, limited in distribution, and unaccompanied by any mental disorder; or the mental deterioration may be particularly severe and set in long before the choreic movements develop.[3]

[1] W. G. Ryon. *A Study of the Deterioration Accompanying Huntington's Chorea.* N. Y. State Hosp. Bulletin, Feb., 1913.

[2] George Huntington. *On Chorea.* The Med. and Surg. Reporter, Apr. 13, 1872.

[3] C. B. Davenport. *Huntington's Chorea in Relation to Heredity*

The anatomical changes found post mortem consist mainly of brain atrophy, shrinkage of cortical cells with dilatation of peri-cellular spaces, and occasionally internal hemorrhagic pachymeningitis.

and Eugenics. Proc. of the National Academy of Sciences, Vol. I, p. 283, May, 1915.

CHAPTER X

ACUTE ALCOHOLISM; PATHOLOGICAL DRUNKENNESS

THE term *drunkenness* is here used to designate the nervous and mental symptoms by which acute alcoholic intoxication manifests itself.

The *predisposition* to the state of drunkenness, quite variable in different subjects, is a part of the general tendency of the individual toward nervous and mental disorders: "It may be truly said that alcohol is the touchstone of the equilibrium of the cerebral functions." [1]

We have had under observation an imbecile whom a single glass of wine sufficed to make drunk.

Drunkenness is somewhat schematically divided into two stages: (1) excitement, and (2) paralysis. In reality

[1] Féré. *La Famille névropathique.* Paris. F. Alcan.—This statement is correct, *everything else being equal.* But it must be borne in mind that there are other factors, besides mental instability, that have to do with an individual's susceptibility to alcohol. *Age* is one such factor, young persons being more susceptible than middle aged or old ones. But by far the most important factor is *habit.* We know well that it is not uncommon for morphine addicts, who have gradually acquired a tolerance for that drug, to take as much as twenty grains at a dose with no other than a mild euphoric effect, whereas one-fortieth of this dose produces profound sleep in an ordinary person, and one-fourth may readily prove fatal. We know also that the same kind of tolerance can be acquired for arsenic and for many other poisons, and, in fact, we often utilize this very principle in the artificial production of immunity against certain microbic toxines, such as those of diphtheria and tetanus. It is undoubtedly so also in the case of alcohol, for it is on the basis of such an acquired tolerance that chronic alcoholics often boast of being able to "stand any amount" or at least of being "always able to navigate."

paralysis is present from the beginning, but in the first stage it is limited to the higher psychic functions and is masked by the intensity of the automatic phenomena, so that it does not become evident until the second stage, when *all* the nervous and mental functions become involved in the paralysis.

First Stage: Excitement.—*Psychic inhibition,* the first manifestation of the paralysis, is seen in the slow association of ideas, distractibility, and insufficiency of perception.[1] The automatism is apparent from the disconnected conversation, which may show true flight of ideas, abnormal pressure of activity, more or less marked morbid euphoria and irritability, impulsive character of reactions, and extremely voluble speech. The moral sense and regard for common conventionalities gradually disappear, and the patient may commit ridiculous, repugnant, offensive, or even criminal acts.

Second Stage: Paralysis.—Paralysis, confined in the preceding stage to the sphere of the higher psychic functions, now attacks the automatic functions. The movements are awkward and clumsy, speech indistinct, gait unsteady. Gradually the patient falls into a profound, sometimes comatose, sleep—the final stage—from which he awakes lucid but with a confused recollection of what has passed and with a pronounced sensation of mental and physical fatigue.

Such is, rapidly sketched, the aspect of common drunkenness. From the accentuation or obliteration of certain features result the diverse abnormal or pathological forms.

Comatose Drunkenness.—The phenomena of excitement are either absent or very transient. From the beginning the paralysis affects the entire brain. The patient sinks and remains inert and insensible for several hours. His face is congested. Gradually the comatose state is replaced by sleep, from which the patient awakes without any recollection whatever of the occurrences immediately preceding his intoxication. Sometimes the pulse becomes

[1] Rüdin. *Auffassung und Merkfähigkeit unter Alkoholwirkung.* Kraepelins Psycholog. Arbeiten, Vol. IV, No. 3.

small, the heart weak, the breathing labored, and in some cases, which are fortunately rare, the patient dies in collapse.

Maniacal Drunkenness.—Here paralysis occupies a secondary position and excitement dominates the scene. The phenomena of agitation generally develop very rapidly. All of a sudden the drunkard, while still at the saloon-keeper's bar, is seized with an outbreak of furious madness without any apparent cause or provocation; he breaks objects and furniture, becomes noisy, and threatens and attacks those about him. The extreme clouding of consciousness shows that, in spite of appearances, "psychic activity takes but a very small part in the production of the outbreak," and that "subjugated by this automatic development of psycho-motor activity it disappears entirely."[1] Almost always numerous psycho-sensory disorders (hallucinations and illusions) are associated with the clouding of consciousness and excitement.

The attack terminates in profound sleep. This, as in the preceding form, is followed by almost complete amnesia.

Convulsive Drunkenness.—The maniacal form of drunkenness resembles closely the delirious attacks of epilepsy. The relation between epilepsy and acute alcoholic intoxication appears still closer when we consider that drunkenness may clinically assume the aspect of an epileptic seizure. This is explained by the convulsive properties of alcohol, which have been demonstrated experimentally. Attacks precisely like those of essential epilepsy may supervene in the course of common drunkenness. In all cases they immediately follow the alcoholic excesses, differing in this respect from those epileptiform seizures which supervene in the course of chronic alcoholism.

Delusional Drunkenness.—This curious but rare form has been studied by Garnier. The delusions are extremely variable: ideas of persecution, ambitious ideas, depressive ideas with suicidal tendencies, etc. Delusional drunken-

[1] Garnier. *La folie à Paris.*

ness is encountered only in profoundly neuropathic individuals.

Pathological Anatomy.—The lesions of acute alcoholic intoxication have been studied chiefly in animals poisoned experimentally. *Macroscopically* there are congestion and sub-pial hemorrhages. *Microscopically* are found, in addition to engorgement and distention of the blood-vessels, nerve-cell changes consisting principally in swelling of the nuclei and peripheral chromatolysis. These lesions are most marked in the motor cells of the spinal cord, but they exist also, though less pronounced, in the cells of the cortex.[1]

Treatment.—This of course varies with the different forms. Maniacal or delusional drunkenness requires strict watching and immediate isolation; the comatose form requires the use of external and internal stimulation (friction, ammonium, ether, caffein).

[1] Marinesco. Semaine médicale, June 14, 1899.

CHAPTER XI

CHRONIC ALCOHOLISM

Chronic alcoholism manifests itself: (1) in permanent symptoms (the stigmata of alcoholism), and (2) in episodic accidents.

I. Permanent Symptoms

The permanent symptoms are psychic and physical.

A. PSYCHIC SYMPTOMS

There is weakening of all the psychic functions.

Intellectual Sphere.—*Intellectual activity* and *capacity for work* are diminished. The patient becomes dull, negligent, and clumsy.

The disorders of memory consist in definite *retrograde amnesia* by destruction of impressions, associated with more or less marked *anterograde amnesia.* The former follows the general law of amnesia. Its course is slowly progressive; but it is rare for it to reach as complete a development as it docs in general paralysis. The anterograde amnesia renders it difficult or even impossible for the patient to acquire new impressions; thus *the stock of ideas* becomes more and more impoverished.

The *judgment* is constantly affected: the patient realizes but imperfectly his condition and the importance and significance of his acts.

Emotional Sphere.—As in most affections with a basis of mental deterioration, we find in chronic alcoholism *indifference* associated with *morbid irritability.*

The chronic alcoholic is not at all concerned with his ruined business, the misery of his family, or the compromise of his honor. Only the desire for alcohol can still arouse him from his mental torpor. The atrophy of the moral sense, which in these cases goes hand in hand with the general indifference, is such that in order to procure his favorite drinks the patient does not hesitate to make use of the most unscrupulous means and to associate with the vilest characters. If he still works, he spends his earnings on drink. If he does not work, as is the rule in such cases, he accumulates debts in the lowest drinking dens, extorts from his relatives what little money they may have earned by hard labor, and he may even resort to stealing.

The *irritability* and the *impulsive tendencies* give rise to violent, terrible outbursts of anger, and often to assaults and attempts of murder.

Delusions may appear at times, almost always those of persecution or of morbid jealousy. When they become more developed and acquire a certain fixedness they constitute alcoholic delusional states, which we shall study farther on.

Still the patient's obscure consciousness presents at times a temporary lucidity. Strong remonstrances of friends or grave disorders of the general health may give birth to repentance. The unhappy subject regrets his excesses, declares himself a great sinner, swears by all that is holy that he will not take another drop of wine or liquor, and announces his intention to join a temperance association. These good resolutions are carried out for several days, weeks, or even months; but almost always the patient falls again: his feeble will gives way and he can struggle no longer. He is in a vicious circle: he drinks because his will is weak, and his will is weak because he drinks.

When they attain a certain degree of intensity, the mental disorders which I have sketched constitute *alcoholic dementia.*

Alcoholic dementia is slowly *progressive.* It takes years

to become fully established. Moreover—and this is a highly important feature—it ceases to progress with the cessation of the alcoholic excesses.

B. PHYSICAL SYMPTOMS

The *sleep* is diminished, restless, disturbed by unpleasant dreams. The patient is apt to dream that he is at his occupation (occupation-dreams); the work is pressing, but in spite of his diligence he is always behind and the results are unsatisfactory. At other times veritable dramas are enacted: assassins pursue him, rats run at him, snakes and monstrous spiders creep over him (zoopsia). These dreams present all the characteristics of delirium tremens, which has been aptly called a prolonged dream. Sometimes the patient wakes up in the midst of his nightmare with his head heavy, the body covered with perspiration, still doubting the inanity of his terrors.

Attacks of vertigo and flashes of light, which often precede and usher in apoplectiform attacks, occur in some cases.

The motor disturbances consist in muscular weakness, chiefly marked in the lower extremities, a tendency to lassitude, and a constant *tremor* affecting especially the tongue and hands; the digital tremor is rendered very apparent when the patient holds out his hand and slightly spreads out his fingers: it is a fine, vertical tremor, not very rapid.

The *tendon reflexes* are sometimes exaggerated, but much more frequently diminished or abolished; the *cutaneous reflexes* are usually exaggerated (plantar reflex), especially in intoxications by the essences (absinthe); sometimes they are abolished; the *pupils* are paretic and sometimes slightly myotic. Occasionally there is a slight degree of strabismus or of ptosis. *Vision* is frequently impaired, due to retrobulbar neuritis; there is diminution of the acuteness and there may be a " central scotoma having

the shape of an ellipse the long axis of which is horizontal" (Babinski).

Cutaneous sensibility is reduced in the large majority of cases; the hypoæsthesia is often unilateral; in such cases it is associated with other hysteroid manifestations: hysterogenic zones, globus hystericus, absence of the pharyngeal reflex.

Among the disorders of *deep sensibility* are to be noted numbness, tingling, hyperæsthesias of portions of muscles which are painful on pressure or are cramped; dull pains with lancinating paroxysms resembling the lightning pains of tabes.

The motor and sensory disturbances, whatever their distribution may be, are usually due to *polyneuritis,* which is a frequent manifestation of chronic alcoholism.

The *gastro-intestinal disorders* are manifested by anorexia, pyrosis, "dry retching" in the morning, slow and painful digestion, and constipation.

The *liver* is often enlarged, and so is also the spleen. True alcoholic cirrhosis is sometimes met with, but assumes a special aspcct, the principal peculiarity of which is absence of ascites.

Diagnosis.—Chronic alcoholism is to be differentiated chiefly from those diseases in which there is mental deterioration: dementia præcox, general paralysis, and senile dementia. The student is referred to the chapters devoted to these diseases for discussions of differential diagnosis.

Prognosis.—This is always grave. The symptoms of mental deterioration once established are not likely to become abated. The timely suppression of alcohol prevents their appearance or, if they are already present, arrests their progressive course. Unfortunately this is very difficult to accomplish.

Pathological Anatomy.—The arterial system is the seat of atheromatous degeneration the intensity and extent of which are variable; it affects especially the arterics of the brain. Atheromatous changes in the arteries at the base

are frequent, though not constant. The arterioles and capillaries may present a state of degeneration characterized by the presence of granular masses containing nuclei, which indicate their cellular origin.

The nerve-cells undergo "a certain degree of granulo-pigmentary and fatty degeneration." [1] The nerve fibers, especially the tangential and commissural fibers, are partially atrophied.

The extent of the lesions in the nervous elements is proportionate to that of the mental deterioration. Therefore it is especially marked in cases of advanced dementia.

The organs of the vegetative functions present the usual lesions of alcoholism: myocarditis, interstitial nephritis, alcoholic gastritis, fatty degeneration of the liver. The hepatic lesions have become of special interest since Klippel has shown that they are the immediate cause of certain deliria occurring in alcoholics.

Etiology.—How does one become an alcoholic? This question resolves itself into two other questions, as follows:

1. Why does a given individual drink alcohol in injurious doses?

2. Why are certain nervous systems more susceptible than others to the poisonous action of alcohol?

It would require a volume to reply fully to the first question; indeed, it would mean a solution of the gigantic problem of alcoholism in its social relations. According to Kraepelin, heredity seems to play a certain rôle. The tendency to alcoholic excesses is transmitted to descendants. Féré also states that "to become an alcoholic one must be alcoholizable; the mere indulgence in fermented beverages is not in itself sufficient." This factor is of some importance, though slight as compared with *social factors*. Among the latter the most powerful is undoubtedly the widespread *ignorance of the true action of alcohol*, as well as the false disastrous notion prevailing among all classes of society that alcohol gives strength and is therefore indispensable

[1] Klippel. *Du délire alcoolique.* Mercredi médical, Oct., 1893.

to the workingman in the performance of hard labor. Though it is to-day a well-established fact in the medical and scientific world that alcohol produces but an illusion of strength and that the sense of increased energy which it gives is but a morbid subjective phenomenon, this idea is still looked upon by the public as an innovation of doubtful certainty, "an invention of the doctors."

To ignorance is joined the element of *suggestion.* There can be no doubt that many begin to drink by chance or by example. For a laborer in some countries it is almost impossible in his social intercourse to escape alcoholism, even though he may be aware of its dangers. His comrades drag him into the saloons, which constitute perpetual temptations on his way. Refusal to accept their invitations exposes him to their ridicule and ill-treatment, and condemns him to the isolation of a social outcast; here, as everywhere else, "to do as others do" is the great principle that governs the individual and obliges him to conduct himself against his own interest and even against his own inclinations.

Among the social causes there are a great many special factors, one of which deserves special mention, namely, grief. Some alcoholics abandon themselves to drink on account of financial ruin, others because of domestic unhappiness, etc. However, it is to be remembered that very often patients claim their misfortunes to have been the cause of their intemperance, while in reality they are the effect. The drunkard pretends that he drinks to find relief from his domestic troubles, while in fact his intemperance has caused them.

We now have to answer the second question: Why does alcohol exert a rapid and intense action upon certain nervous systems, while others resist successfully much greater excesses?—It is here that individual predisposition comes into play.

Like the symptoms of acute alcoholism, those of chronic alcoholism appear chiefly in *predisposed* individuals; and the greater the predisposition the more rapidly do these

symptoms develop. We see daily in general hospitals patients presenting atheroma of the arterial system, alcoholic cirrhosis, etc., and showing but slight if any nervous or mental disorders; while in insane hospitals patients are admitted whose alcoholic excesses have been relatively slight and whose nervous systems have nevertheless already suffered irreparable damage. The quality of the soil is therefore of primary importance.

The pathogenic action of alcohol is also favored by all factors which diminish the resistance of the organism, such as stress, grief, want of sleep, and acute or chronic infectious diseases (tuberculosis). Thus we often encounter, associated in the same subject, the abuse of alcohol, predisposition, and debilitating influences.

It would be useful to know which among the alcoholic beverages produce so great a toxic action as to be particularly responsible for the production of alcoholism. Clinical evidence seems to show that the principal factor in alcoholism is the *quantity* and not the *quality* of the beverage ingested. The experiments of Joffroy and Serveaux have shown clearly that alcoholic intoxication is due to *ethyl alcohol* itself, and not to the impurities often associated with it. Therefore all fermented beverages may cause alcoholism: liquors, alcoholic tonics, wines, beers, ciders, the alcohol of beverages as well as that of substances used in the industries. However, "a given quantity of alcohol is more toxic the more concentrated it is; for this reason the stronger alcoholic beverages play a prominent rôle in the production of alcoholism." [1]

Treatment.—Alcoholism, once established, requires no other treatment than *abstinence* from alcoholic beverages. Generally this can only be enforced in a hospital for the insane or for inebriates.[2] The patient, on being cured of his drink-

[1] Antheaume. *De la toxicité des alcools.* Thèse de Paris, F. Alcan, 1897. This work contains the results of the experiments of Joffroy and Serveaux.

[2] Sérieux. *Les éstablissements pour le traitement des buveurs en Angleterre et aux États-Unis. Projets de création d'asiles d'alcooliques*

ing habit and returned to normal life would do well to join a total abstinence society where he will find the support which his wavering will power is still in need of.

II. Episodic Accidents

The episodic accidents of chronic alcoholism are of four kinds: delirium tremens, acute hallucinosis, delusional states, and the polyneuritic psychosis.

DELIRIUM TREMENS

The **prodromata** consist in an accentuation of the symptoms of chronic alcoholism. *Sleep* is more than ever disturbed by nightmares, preceded by painful hypnagogic hallucinations, and reduced in the last days before the attack to a vague somnolence. Violent headaches and a sort of inexplicable uneasiness usher in a grave affection.

Psychic Symptoms.—These were admirably analyzed years ago by Lasègue and more recently by Wernicke. Three chief symptoms dominate the scene: disorder of consciousness, hallucinatory delirium, and motor excitement.

The *disorder of consciousness* involves exclusively the notion of the external world, i.e., allopsychic orientation, leaving intact the notion of personality, i.e., autopsychic orientation (Wernicke).

Illusions and *hallucinations* are constant and at times incessant. They present two general characteristics: (1) they are *painful;* (2) they are *combined* in such a manner as to form complete scenes and create around the patient a whole imaginary and often fantastic world. They affect all the senses, but the most interesting among them are those of *vision* and *general sensibility.*

en Autriche et en France. Bullet. de la soc. de méd. ment. de Belg., 1895.—By the same author. *L'assistance des alcooliques en Suisse et en Allemagne.* Ibid.—Also. *L'Asile d'alcooliques de département de la Seine.* Ann. méd. psych., 1895, Nov.–Dec.

The visions of delirium tremens are always mobile and animated. They form an uninterrupted succession of strange, painful, or terrifying scenes. At the same time that the patient has visions of assassins or ferocious and horrible animals, he feels their blows, bites, or their repulsive contact: the murderer's dagger or the fangs of dogs or tigers sink into his flesh, spiders run over his face, and snakes slip and crawl under his clothes.

Two principal forms of delirium may be distinguished: (*a*) occupation delirium, and (*b*) persecutory delirium.

(*a*) *Occupation Delirium.*—The patient imagines that he is amongst familiar surroundings and at his usual occupation. The hallucinations possess remarkable distinctness and intensity: the cab driver leads his horses, urges them on, whips them, and runs over pedestrians who do not get out of his way quickly; the café waiter waits upon guests, receives money, shows them to vacant seats. Like the dreams of the alcoholic this occupation delirium is generally of a painful character.

(*b*) *Persecutory Delirium.*—The psycho-sensory disorders assume a terrifying character. Grimacing and horrible forms are seen in the folds of the curtains, on the window-panes, or on the walls. Assassins come out of every corner; the patient hears clearly their threats and abuses and describes their costumes and their weapons. He sees frightful and fantastic animals; rats, snakes, gigantic tigers fill the room, constantly changing their shapes and throwing themselves upon the wretched subject, who repels them with desperate efforts. An odor of poison proceeds from all sides; the food has a putrid taste.

The *motor excitement* is at times very violent. The patient walks to and fro in the dormitory or in his room, seeks his clothes, strikes the walls to open a passageway for his escape, emits cries of terror; or he whistles and sings, assuming in the intervals a conversational tone, as he imagines himself surrounded by his acquaintances. The movements, though sudden and awkward, always have a

psychic origin (Wernicke); it is true that they are determined by imaginary representations and sensations, but they invariably present the character of *purposeful acts.* The patient who believes himself to be in his workshop goes through the regular movements necessary for the performance of his habitual work; another, the victim of terrifying hallucinations, executes the movements of flight or of defense.

On viewing broadly all the preceding symptoms we observe that the hallucinations of delirium tremens are like a *dream in action.* Just as a sleeper can be roused so can the patient be momentarily roused from his delirium by a sudden interpellation. One then obtains correct responses, so that the patient may create the impression of a normal person. But as soon as he is left alone he relapses into his delirium and agitation.

Physical Symptoms.—The *tremor* of chronic alcoholism becomes exaggerated so that there is a shaking of the entire body.

The *speech* presents a characteristic tremulousness.

At times a slight degree of syllabic stuttering, paraphasia, facial paresis, or even hemiparesis appears, showing the *participation of the projection centers* in the morbid process.

The *tendon and cutaneous reflexes* are usually exaggerated.

A certain degree of *hyperæsthesia* is the rule. The morbid irritability of the psycho-sensory centers explains the facility with which it is possible, by a simple suggestion or by slight mechanical stimulation, to bring forth a hallucination, even after the spontaneous psycho-sensory disorders have disappeared (induced hallucinations of Liepmann).[1]

We encounter also paræsthesias and even anæsthesias.

Fever is almost a constant symptom; its presence furnishes an excellent element for prognosis. In favorable cases the temperature does not rise beyond 39° C., reaching its maximum towards the end of the second day. Deferves-

[1] *Arch. f. Psychiatrie,* XXVI.

cence takes place either rapidly or by lysis. In grave cases the temperature rises above 39° or even 40° C.

There are also to be noted a *dyspeptic condition* of the digestive tract which is often very marked; usually slight, sometimes severe *albuminuria;* a rapid, full, and bounding *pulse* which, in grave forms, becomes small and easily compressible. Under these unfavorable circumstances the general nutrition suffers and there is loss of flesh which becomes very considerable in a few days.

Complications.—Among those involving the nervous system the most frequent are epileptiform seizures which may precede by thirty-six or forty-eight hours the onset of the delirium, or they may occur during the attack. The most formidable as well as the most common complication is pneumonia, which affects chiefly the apex of one lung and assumes from the beginning a grave aspect.

Prognosis.—There are two possible terminations: *recovery* and *death.*

Recovery is the rule. It takes place within four or five days after a deep and prolonged sleep. The sleep may come on suddenly or it may be preceded by a period of calmness.

The duration of delirium tremens is sometimes *abnormally brief* (several hours), and at other times *abnormally long* (a few weeks or even months).

Convalescence is marked at the beginning by a certain amount of confusion which persists for some time and which may or may not be associated with delusions.

Death may occur from exhaustion, from an epileptiform attack, or from some complication (pneumonia).

Diagnosis.—Attacks very similar to delirium tremens are seen outside of alcoholism, notably in senile dementia, general paralysis, and meningitis of the cerebral convexity. In the latter affection the diagnosis is based upon the existence of specially marked and numerous focal symptoms such as Jacksonian epilepsy, strabismus, etc., upon the condition of the optic disc, and upon the course of the disease.

The points of differentiation from general paralysis and from senile dementia will be studied in connection with these affections.

Pathological Anatomy.—To the lesions of chronic alcoholism already considered are added *exudative hyperæmia* and *inflammatory diapedesis*, which are the expression of an acute process analogous to that observed in infections.

The *nerve-cells* lose their normal shape and structure, their angles become blunted, and their chromatophylic granulations are broken up or disappear entirely. The *nerve fibers* degenerate.

These lesions are present throughout the cortex, including centers of projection. It is not rare to find also a certain degree of degeneration in the pyramidal bundles and in the posterior columns.

The *visceral lesions* are often dependent upon some complicating infection, such as influenza, infection by the pneumococcus, or typhoid fever.

The *heart* is the seat of a myocarditis which in many of the fatal cases constitutes the immediate cause of death.

The *liver* shows degeneration which is so frequent and at times so pronounced that Klippel [1] has been led to attribute delirium tremens to autointoxication of hepatic origin.

The lesions in the *kidneys* are, according to Herz,[2] those of acute parenchymatous nephritis. He states that these lesions are constant.

Pathogenesis.—Delirium tremens is not to be considered as a simple alcoholic intoxication, a sort of belated drunkenness caused by an accumulation of the poison in the organism. Its clinical aspect in fact differs radically from acute intoxication. Moreover it is apt to break out even after several days' abstinence. Finally, the patient

[1] Klippel. *Du délire des alcooliques. Lésions anatomiques et pathogénie.* Mercredi médical, Oct., 1893.—*De l'origine hépotique de certains délires des alcooliques,* Ann. méd., psych., Sept.–Oct., 1894.

[2] Abstract in Centralblatt für Nervenheilkunde und Psychiatrie, May, 1898.

recovers even when alcohol is administered in large doses during the delirium.

Some authors, Wernicke among them, attribute delirium tremens to sudden withdrawal of alcohol. This view finds corroboration in the army experiences during the World War. In all National Army cantonments the arrival of almost every contingent of drafted recruits was followed within a few days by the development of a crop of cases of delirium tremens for which there seemed to be no cause other than the suddenly enforced abstinence.

An important fact upon which Joffroy frequently insisted in his lectures is that delirium tremens often breaks out at the occasion of a supervening infection, such as influenza, pneumonia, or suppuration. Thus it seems that the disease is caused by two agencies, alcoholism and some supervening condition, most frequently an infection.

By what mechanism does their combination produce this effect?—Possibly by determining an autointoxication by insufficiency either of the liver (Klippel) or of the kidneys (Herz).

It should be remembered, however, that in many cases the second factor, the accidental infection, is not found. Perhaps, reduced to some disorder possessing in itself no apparent gravity, such as an attack of gastric indigestion, it passes unnoticed.

If it is true that delirium tremens is, as suggested above, a result of sudden withdrawal of alcohol, a condition, in other words, analogous to the symptoms of abstinence seen in cases of drug addiction, then its development in cases of supervening acute diseases or injuries may be due mainly to the abstinence incidentally resulting from the patient's confinement to bed either at home or in a hospital.

Treatment.—Rest in bed is very useful and is applicable in the great majority of cases. More than in any other psychosis, in this disease mechanical restraint is dangerous and must be prohibited.

The *administration of alcohol* is a time-honored practice

and was found very efficacious in the army cases referred to above. It seems to do good in many ways and in many types of cases: (1) It seems capable of preventing delirium tremens. If the withdrawal of alcohol in a case of chronic alcoholism is accomplished not suddenly, but gradually, the danger of delirium may be lessened or obviated. (2) In the prodromal period or very soon after the onset of delirium tremens the administration of alcohol may abort the attack. (3) In the course of delirium tremens the judicious administration of alcohol seems to lessen agitation, improve the physical condition, shorten the attack, bring early sleep, and prevent exhaustion with its possible fatal termination. (4) In cases apparently threatened with heart failure alcohol seems to be the most efficacious stimulant.

The *food* should be substantial, yet such as would least tax the digestive system. A milk diet admirably fulfills this double indication. A glass every hour during the day may be given, so that the patient will get about 2½ or 3 quarts a day. Sometimes it is useful to add eggs, beef juice, or chopped meat. During convalescence full diet may be gradually resumed.

As regards *medication*, sedatives and hypnotics may be required early and heart stimulants late in the course. Bromides, paraldehyde, and chloral are commonly used and, for stimulation, strychnin, digitalein, caffein, and ether. Alcohol in these cases seems to be, however, the best sedative, hypnotic and stimulant and its administration may render all other medication unnecessary.

ACUTE HALLUCINOSIS; DELUSIONAL STATES

Acute hallucinosis differs from delirium tremens: (1) in the predominance of hallucinations of hearing over those of sight; (2) in the absence of any marked disorder of consciousness; and (3) in its course, which is of longer duration.

After a rather prolonged prodromal period marked, as in the case of delirium tremens, by an accentuation of the

symptoms of chronic alcoholism, the patient becomes uneasy, distrustful, and suspicious. Gradually false interpretations, illusions, and persecutory ideas become established. He does not dare to leave the house, feeling that he is being watched, insulted or threatened by passers-by or followed by the police. Very early hallucinations of hearing appear followed often by hallucinations of other senses.

The disease rapidly reaches its height of development and then presents the following fundamental features:

(*a*) *Conservation of lucidity:* the patient remains well oriented, understands questions, and answers relevantly.

(*b*) *Painful character of the delusions and of the psycho-sensory disorders:* ideas of persecution of a variable nature: fear of being poisoned or assassinated, ideas of jealousy; imaginary insults or threats; frightful visions, especially marked at night, grimacing figures, ghosts, detectives coming to take the patient into custody, executioners, etc.; a taste or an odor of poison or of fæcal matter; sensations of scalding, pricking, or electric currents; motor hallucinations. These latter phenomena, but slightly marked in the majority of cases, point to a grave prognosis when they assume a certain intensity; they often forebode a prolonged course of the disease and indicate a tendency towards mental deterioration. Hallucinations of taste and smell often cause refusal of food.

(*c*) *Tendency to systematization:* the patient seeks an explanation and a cause for the persecutions. However, the systematization is of rapid development and is not always very accurate.

(*d*) *Depressed mood and aggressive tendencies:* the patient, profoundly irritated, wreaks his vengeance upon innocent victims, being determined to defend himself against the persecutions of his enemies or to escape them by any possible means. If such a patient desires to die it is not, as other classes of patients, for the purpose of expiating some crime or of finding relief from remorse, but solely to escape the frightful tortures prepared for him by his enemies. Often

he transforms his house into a veritable arsenal and, unfortunately, does not limit himself to mere demonstrations, but makes use of his weapons.

The somatic disorders of chronic alcoholism are all present in this affection. Sleep is diminished and filled with the pathognomonic dreams.

The urine often contains a trace of albumen.

As a general rule an attack of acute hallucinosis tends toward *recovery*. This takes place gradually after several weeks or at most several months.

The *prognosis* is, however, not altogether favorable, firstly because recurrencies are common, and secondly because each successive attack leaves a noticeable trace upon the intelligence and accelerates the course of alcoholic dementia.

It is of great importance to make the differential *diagnosis* between acute hallucinosis and the other affections in which systematized delusions are encountered, viz., dementia præcox, *délire chronique*, and paranoia. The reader is referred to the respective chapters devoted to these diseases for the points of differentiation.[1]

The *treatment* is that of chronic alcoholism. The violent reactions usually necessitate commitment. Attacks of excitement are to be treated by the usual methods.

Between acute hallucinosis and the *alcoholic delusional states* there is no sharp line of demarcation; the principal distinction is in the predominance in the latter of delusions, while hallucinations play but a subordinate part. Some cases are acute, of brief duration, and more or less closely connected with sprees or unusual excesses in drinking; others are chronic, subsiding only in part, if at all, upon the withdrawal of alcohol and lighting up again promptly upon the resumption of drinking or even without it merely upon the patient's return from the institution to his home and old

[1] G. H. Kirby. *Alcoholic Hallucinosis, with Special Reference to Prognosis and Relation to Other Psychoses.* Psychiatric Bulletin of the N. Y. State Hospitals, July, 1916.

surroundings. The delusions are mostly of persecution and often may be plainly seen to originate from a subconscious effort on the part of the patient to place upon others the blame for the conditions resulting from his intemperance: the fellow workmen annoy him in various ways, have plotted against him, have caused him to lose his position; his employer discriminates against him; the labor unions are spreading bad reports about him to prevent him from getting employment; especially characteristic are *delusions of jealousy* based, for the most part, on misinterpretations of most trivial occurrences: the bedspread is wrinkled as though somebody had lain on it, the wife leaves the house too often claiming to go to the store or to visit her mother, the milkman's "Good-morning" seems suspiciously friendly, the coffee tastes queer, probably on account of poison put in by the wife to get rid of the patient. These delusions often lead to violent quarrels, disgraceful scenes, beating, and threats or even attempts of homicide.

POLYNEURITIC PSYCHOSIS

The polyneuritic psychosis or Korsakoff's disease[1] is an affection characterized by the association of phenomena of polyneuritis with specific mental disturbances among which *amnesia* of diverse forms constitutes a preponderant feature. Although it occurs most frequently on a basis of chronic alcoholism, it is also sometimes observed independently of chronic alcoholism, following a profuse hemorrhage or an infectious disease, such as influenza.

Symptoms.—In some cases the symptoms of the polyneuritic psychosis appear gradually, without any striking phenomena at the onset; much more often the onset is acute: agitation, numerous hallucinations, and anxiety render the resemblance to *delirium tremens* so marked as to lead frequently to errors in diagnosis. After several days the

[1] Congrès de Médecine, 1889.—Luckerath. *Beitrag zu der Lehre von der Korsakow'schen Psychose.* Neurol. Centralblatt, April, 1900.

agitation subsides, but the disorientation persists and the characteristic amnesia appears together with the phenomena of polyneuritis.

The amnesia is both anterograde and retrograde.

The *anterograde amnesia* results from the total abolition, or at least a marked diminution, of the power of fixation. The patient forgets in a few moments a visit which he has received or the gist of what he has just read. On leaving the table he asks whether it is not almost time for dinner and complains of having no appetite.

The *retrograde amnesia* is purely functional, by default of reproduction; in the course of time old representations reappear intact.

The effacement of representations occurs in conformity to the law of retrogression. Depending upon the severity of a particular case, the amnesia involves the events of a more or less considerable period of time.

Pseudo-reminiscences, illusions and hallucinations of memory fill the gaps created by the amnesia. Thus quite frequently the patient is totally unconscious of his disorder of memory and unhesitatingly replies to all questions put to him. Often also, modifying facts of which his impression is more or less vague, adjusting some details and suppressing others, the patient narrates *imaginary occurrences* the principal features of which are their *mobility*, their easy *modifiability* by appropriate suggestion, and their being usually limited to the bounds of possibility. The latter characteristic is, however, not constant, for the fabrications in the polyneuritic psychosis may be altogether improbable or even absurd.

The following specimen has been taken from an observation made upon a case .of polyneuritic psychosis due to absinthe:

Q. How long have you been here?

A. Since this morning.

Q. What were you doing yesterday?

A. I went to the market to buy some eggs. After that I went to see my sister and took dinner with her.

Q. Don't you ever go to the theatre?

A. Oh, that's true, . . I went there after work last night . . . it was very beautiful.

Q. What play did you see?

A. Really . . . just wait a minute . . . it was very beautiful . . . they sang . . . they had superb costumes . . . I cannot recollect the name of the play.

In reality the patient, who had been in the hospital during the three weeks previous, had not left his bed since his admission on account of very marked paresis of both lower extremities.

To these pathognomonic disturbances of memory are added also *complete loss of orientation* of time and place, numerous *illusions* which often lead to mistakes of identity and occasional *hallucinations* which are more or less fleeting.

The *emotional* tone is usually one of indifference; sometimes there is slight euphoria or undue irritability.

In spite of their intensity the psychic symptoms are in many cases not very apparent at first. The patients are quiet, understand well the questions put to them, and reply in a calm and often even in an intelligent manner. They often appear to be normal because a conversation of several minutes may not suffice to reveal the pathognomonic amnesia and disorientation.

The *signs of polyneuritis*, paresis of the lower extremities, abolition of the tendon reflexes, paræsthesias, pains, hyperæsthesias of circumscribed muscular masses—to mention only the principal ones—vary widely in intensity. They are at times mild, while the mental disturbance may be quite marked. Possibly they may be even entirely wanting in certain cases that are perfectly typical from the psychic standpoint.

The general health is usually affected to some extent. Occasionally cachexia may develop and end fatally. Also cardiac disturbances are often noted, feeble action, irregularity, etc., which in a number of cases are dependent upon a neuritis of the pneumogastric nerve.

Duration, Prognosis, Diagnosis.—The *duration* of the active period of the disease is usually several months, seldom over a year. There then remains a characteristic state of mental deterioration dependent upon a persisting and more or less pronounced impairment of the power of retention, with resulting disorientation and amnesia for recent occurrences. The tendency toward active fabrications and pseudo-reminiscences becomes less marked and often disappears.

In some few cases there is partial restoration, so that the patients are again able to keep track of dates and current events, but complete recovery is a rare exception in alcoholic cases, though it is said to be common in cases with a different etiology.

Another mode of termination, also infrequent, is *death*, which results either from cachexia or from some complication: influenza, pneumonia, tuberculosis.

The *diagnosis* is based on (*a*) the very marked and characteristic disorders of memory; (*b*) apparent lucidity of the patient, contrasting with the real disorientation; (*c*) coexisting signs of polyneuritis.

Treatment.—Treatment in the acute stage of the disease consists chiefly of rest in bed combined with a reconstructive diet.

It is scarcely necessary to add that abstinence from alcohol should be rigorously enforced, especially where alcoholism is the cause.

CHAPTER XII

DRUG ADDICTIONS

It would seem that the use of narcotics in one form or another is based on a deeply rooted universal human craving.

The manner of gratification of this craving varies in different parts of the world according to local conditions and racial customs.

The substances most commonly used are alcohol, opium, Indian hemp, coca, and tobacco.

The following table shows the annual per capita consumption of alcohol among Caucasian peoples.[1]

TABLE 14.

France	3.72	gallons
Spain	2.42	"
Germany	2.09	"
Great Britain and Ireland	2.05	"
United States	1.16	"
Russia	.60	"
Canada	.54	"

Opium eating is chiefly practiced in Asia Minor, Persia, and India. In the city of Balasur, British India, which may be taken as a typical example, one in every twelve of the population is an opium eater. Opium smoking has long prevailed in China and on the islands of the Indian Archipelago, although recently measures have been taken by the governments for its suppression. Various products of Indian hemp (*hashish, bhang, ganja, charas*) are used very generally among the Mussulman and Hindu population of India and to a great extent also among the Arabs, Egyptians, and

[1] Year Book of the Anti-Saloon League, 1908

African negroes. *Bhang* is used in India for smoking and an infusion of it in water is used as an intoxicating beverage. Coca leaves are used for chewing very generally by Indians in Bolivia, Peru, Ecuador, Colombia and Rio Negro. Three or four times a day labor is suspended for *chacchar* or *acullicar*, as the chewing of coca is termed. Tobacco is used, as all know, universally for smoking, chewing, or in the form of snuff. The world's annual production of tobacco amounts to nearly two and a half billion pounds.[1]

In the great majority of instances these substances are used in moderation without apparent harm. But in a certain small percentage of users pathological addiction develops leading to intemperate use and chronic intoxication. The drug in such cases becomes a necessity to the organism, and its suppression causes a train of physical and psychic disturbances known as *symptoms of abstinence*.

Etiology.—The moderate use of any of the above-mentioned habit-forming drugs in communities where it is a general or prevalent custom cannot be regarded as pathological and therefore does not concern us here. However, the fact that such a custom prevails is responsible for the development of a good many cases of pathological addiction which would not develop under other circumstances.

In this country drug addiction is not infrequently seen among those who, by reason of their occupation or special environment, can readily procure drugs: physicians, their wives, medical students, pharmacists, nurses, laboratory attendants.

However, neither access to drugs, nor, as we have seen, its more or less habitual use in moderation suffices to produce pathological addiction. The character of the soil is an important factor. A constitutional condition somehow related to the great neuropathic group seems to be the soil on which drug addiction grows. Evidence for this is to be found in the family and personal histories of drug addicts.

[1] Encyclopædia Britannica, 11th edition, articles on Opium, China, Hemp, Bhang, Coca, and Tobacco.

In the family histories are to be found cases of psychoses, psychoneuroses, mental deficiency, inebriety, constitutional psychopathic states, temperamental anomalies, epilepsy, etc. In the personal histories are to be found for the most part psychoneuroses and constitutional psychopathic states. Thus, prior to the development of drug addiction many patients have criminal records, are gangsters, pimps, gamblers, prostitutes, embezzlers, etc.

The constitutional character defects of drug addicts become accentuated through the chronic effect of the drug. It is significant in this connection that the English word *assassin* is derived from the Arabic *hashishin*, meaning hashish eaters.

The habit is started sometimes through medication, occasionally through curiosity and the desire to experience new sensations, but most frequently through the example and proselytism of older addicts.

The drug most frequently used by addicts in this country, particularly in the Eastern states, is *heroin*, 95% of all being addicted solely or chiefly to this drug. Following this in order of frequency are opium, morphine, and cocaine. In France cocaine addiction is the most common.[1]

The age at which the habit is contracted is usually between fifteen and twenty. The most common ways of taking it are by hypodermic injection into the arms, thighs, abdomen, or chest; by snuffing; by smoking (opium); and by the mouth.

The dosage of heroin, morphine, or cocaine in established cases varies from 0.5 to 2 grams per day; in some cases this maximum is exceeded.[2]

The following description of the **symptoms and course** of morphine addiction largely holds good for other drug addictions as well.

Many morphine addicts take their injections without

[1] J. Rogues de Fursac. In a personal communication.

[2] S. R. Leahy. *Some Observations on Heroin Habitués.* N. Y. State Hosp. Bulletin, Aug., 1915.

regularity or precaution and at any opportunity; others, in true epicurean fashion, select the moment and conditions when they can enjoy most profoundly their favorite pleasure. Some, again, have their hours regularly fixed, use only accurately prepared solutions of a certain strength, and take all antiseptic precautions; many take their daily quantity in divided doses; others take a single large dose daily in order to obtain the most intense effect.

According to Chambard four periods may be distinguished in the career of a morphine addict, which follow one another by imperceptible transitions.

First Period: Initiation or Euphoria.—It has been aptly called the honeymoon of the morphine addict. Under the influence of the morphine physical pains, if they exist, disappear or become abated, organic functions become active, and the mind lapses into a pleasant reverie; ideas arise without effort and combine "to form ingenious conceptions, elaborate resolutions, vast projects which, alas, are never likely to last through the day"; depressing thoughts disappear and life assumes a smiling aspect.

This euphoria is identical with that which is produced by opium and of which Thomas De Quincey has given such an enthusiastic description:

"O just, subtle, and all-conquering opium! that, to the hearts of rich and poor alike, for the wounds that will never heal, and for the pangs of grief that 'tempt the spirit to rebel,' brings an assuaging balm;—eloquent opium that with thy potent rhetoric stealest away the purposes of wrath, pleadest effectually for relenting pity, and through one night's heavenly sleep callest back to the guilty man the visions of his infancy, and hands washed pure from blood;—O just and righteous opium! that to the chancery of dreams summonest, for the triumphs of despairing innocence, false witnesses, and confoundest perjury, and dost reverse the sentences of unrighteous judges;—thou buildest upon the bosom of darkness, out of the fantastic imagery of the brain, cities and temples, beyond the art of Phidias and Praxiteles, beyond the splendours of Babylon and Hekatómpylos; and, 'from the anarchy of dreaming sleep,' callest into sunny light the faces of long-buried beauties, and the blessed household countenances, cleansed from the 'dishonours of the grave.' Thou only givest these gifts to man; and thou hast the keys of Paradise, O just, subtle, and mighty opium!"

Second Period: Hesitation.—Many patients, conscious of their danger, make efforts to escape from it. They diminish the doses, reduce the number of injections, etc. Some even completely discontinue the use of the drug permanently or temporarily.

The period of hesitation is not constantly present; many patients by reason of their ignorance or lack of determination pass directly from the first period to the third.

Third Period: Established Addiction.—The poison has now impressed its stamp upon the organism and has established certain *permanent symptoms.* Moreover, its suppression gives rise to a series of characteristic phenomena, the *symptoms of abstinence.*

(A) *Permanent Symptoms.*—(*a*) *Psychic.*—These consist in general reduction of psychic activity, and are manifested in the *intellectual sphere* by sluggishness of association and impairment of attention contrasting with intact orientation and perfect lucidity, and by retrograde amnesia of reproduction; representations are in some way inhibited but not destroyed.

In the *emotional sphere* there are indifference and atrophy of the moral sense. All the aspirations of the patient reduce themselves to a single idea, that of procuring morphine by any possible means; disregard for conventionalities, bribery, swindling, falsehoods, violence, all seem to him permissible. Many morphine addicts obtain their drug from the druggist on false prescriptions, others sell their household articles to purchase morphine.

In the *sphere of the reactions* there is generally marked *aboulia.* The patient is conscious of the ruinous results of his inactivity, but has not the power to overcome it. This symptom appears early and together with the indifference forms a characteristic feature of the mental state in morphine and other drug addictions.

Drug addicts, like criminals, make much use in conversation of a special variety of slang, like the expressions in the following vocabulary.

Toy, a small jar of opium sold for smoking, constituting a sort of standard of measure in the illicit opium traffic.

Blowing, snuffing heroin.

Jabbing, using heroin, morphine, or cocaine by hypodermic injection.

Deck or *Package*, a portion containing one or two doses sold for snuffing.

Quill, a piece of paper curled to be used in snuffing.

An eighth, one drachm (an eighth of an ounce).

A quarter-eighth, half an eighth, two eighths, etc., derived from the expression *an eighth.*

Snow, cocaine.

Snow-bird, cocaine user, a more or less derisive term used by other drug addicts.

(*b*) *Physical.*—The *general nutrition* suffers: loss of flesh, pallor of the skin, etc.

The *circulatory apparatus* shows general atony. The cardiac impulse is weak; peripheral circulation sluggish; there are transient œdemas.

The *temperature* is often subnormal.

Motility: general muscular asthenia; a tendency to fatigue; tremors: "slow, regular oscillations resulting from a twisting movement of the limb upon itself." [1]

Sensibility: slight hyperæsthesia which is at times unilateral; diminution of the acuteness of vision, often dependent upon "pallor of the optic disc, which may advance to atrophy." [2]

The *pupils* are frequently myotic.

The *tendon reflexes* are occasionally diminished.

In cases in which the drug is taken by hypodermic injection there are at the sites of injection characteristic puncture points, spots of pigmentation, indurations, and scars which constitute great aids in diagnosis in cases in which a trustworthy history is not to be had.

(B) *Symptoms of Abstinence.*—When the hour for his injection has passed the drug addict becomes restless, his

[1] Jouet. Quoted by Chambard, *loc. cit.*

[2] Pichon. *Le morphinisme*, 1890.

expression anxious, respirations accelerated. A state of *anxiety* soon appears, accompanied by marked inhibition of all psychic functions. The patient abandons his unfinished work or conversation and leaves, complaining that he is unable to bear the tortures of which he is a victim. At the same time appear pathognomonic *somatic symptoms:* pallor of the face, acceleration and weakening of the pulse, general prostration, cold sweats, sleeplessness, abdominal cramps, vomiting and spells of yawning. If abstinence continues the condition may become alarming: obstinate diarrhœa appears and collapse is threatened.

No matter how grave the symptoms become, an injection of morphine always affords instantaneous relief.

Occasionally the mental symptoms present all the features of a veritable acute psychosis: agitation, anxiety, persecutory ideas, psycho-sensory disorders, excitement simulating that of mania; these may be associated with hysteriform or epileptiform attacks.

Fourth Period: Cachexia.—The symptoms of the preceding period become more marked. The psychic disaggregation in some cases resembles true dementia. Craving for the drug is greater than ever. Loss of flesh reduces the patient almost to a skeleton; the stomach rejects all food and intractable diarrhoea sets in; blood pressure becomes low, the cardiac impulse grows weak, the pulse becomes small, thready, and irregular; renal changes, which are frequent, give rise to albuminuria.

Numerous complications are apt to appear, rendering the prognosis still more serious: pulmonary tuberculosis, furunculosis, phlegmons hasten the fatal termination, which occurs at the end of the fourth period.

Treatment.—Its aim is *discontinuance of the morphine.* This may be attained by three methods: the sudden method (Levinstein), the rapid method (Erlenmeyer), and the gradual method (the so-called French method).

The suppression of morphine or demorphinization cannot be carried out outside of an institution for the following

reasons: (1) because the patient should be, in case of threatened collapse, within immediate reach of medical aid; (2) because only strict control can prevent the patient from procuring the drug clandestinely.

The method of choice is rapid suppression. "It is a fact, recognized to-day by all physicians experienced in the treatment of drug addiction, that rapid suppression is the best method of treatment."[1] The period of demorphinization lasts from five to twelve days. The principle consists in diminishing the dose each day by one-half of that administered on the preceding day, and finally, on reaching a minute ration, completely suppressing the drug. It is in the latter days of the suppression that the symptoms of abstinence appear with the greatest intensity. Patients who descend without much difficulty from 1 gram or more to several centigrams experience grave disturbances when they are deprived of this minute allowance.

Adjuvant Therapy.—The *diet* should be tonic and reconstructive. In cases of marked cachexia it is advisable to improve the state of general nutrition before complete demorphinization.[2]

The digestive tract and the heart demand special attention.

Gastro-intestinal disorders may be prevented by the use of bicarbonate of soda (2–6 grams daily), and cardiac failure by heart stimulants, such as caffein, strophanthus, or digitalis.

A morphine addict cannot be considered cured until a long time has elapsed after the suppression of the drug. The return to normal life is for him a critical moment; for this reason isolation in an institution should be continued for at least several weeks after the last injection.

This prolonged detention is further justifiable by the

[1] Sollier. *La démorphinization.* Presse médicale, April 23 and July 6, 1898.

[3] Joffroy. *Traitement de la morphinomanie.* Gaz. hebd. de Méd. et de Chirurgie, 1899 and 1900.

grave complications, notably fatal epileptiform attacks, which may occur long after complete demorphinization.

In spite of all these precautions permanent cures are the exception and relapses the rule.

Cocaine addiction differs but little in its general aspect from either morphine or heroin addiction. In the course of it, however, arises occasionally a special variety of delirium.

It is a delirium of a painful character associated with delusional interpretations; its main features consist in psycho-sensory disorders which, in spite of their extraordinary distinctness, are coexistent with perfect *lucidity*. The illusions and hallucinations may affect all the senses, but especially vision, touch, and the muscular sense.

Objects change their shapes and are constantly moving. A patient of Saury's [1] felt himself assailed by a swarm of bees which he could see and feel. Patients feel worms creeping over their bodies or coming out of their flesh; they see them, seize them with their fingers, and crush them under their feet. Many also perceive imaginary movements; the ground shakes beneath them, their bed is upset, or the house they are in, swept by a flood, floats upon the waves. Hallucinations of hearing, taste, and smell, though not rare, occur less frequently than the preceding and present no special characteristics.

Sometimes the delusions assume the form of *morbid jealousy*, as in alcoholic psychoses.

The *reactions* of the patient are governed by the delusions and are often violent.

The *duration* of the attack is brief, several weeks at the longest, and in some cases but a few days. We have seen a typical case of cocaine delirium terminate in forty-eight hours.

The *treatment* consists in suppression of the drug, which can in the great majority of cases be accomplished by the rapid method without serious inconvenience.

[1] Saury. *Cocaïnomanie.* Ann. méd. psych., 1889.

CHAPTER XIII

SYPHILITIC DISORDERS
MESOBLASTIC INVASION: CEREBRAL SYPHILIS

EARLY INVOLVEMENT—MENINGITIC TYPE—GUMMATOUS TYPE—ENDARTERITIC TYPE

Early Involvement.—" Recent developments have shown that the occurrence of syphilis of the central nervous system, more particularly of the meninges, is much more common in the secondary stage than has been generally recognized, and that it may occur even earlier than the secondary skin manifestations. Various observers have shown by lumbar puncture that in about 35% of all untreated cases there is an increased cell count and an increased globulin content of the cerebro-spinal fluid, an indication of syphilitic involvement of the meninges. In the early stages the spinal fluid Wassermann is usually negative. Early involvement of the central nervous system is frequently betrayed by certain complaints of the patient—headache, neuralgia, dizziness, slight deafness, slight paralysis of one of the cranial nerves." [1]

" I believe that practically all cases of neuro-syphilis originate in the early stages of the disease. This belief is based upon the results of several hundred serological examinations made in the first year of the infection. In other words the number of cases of neuro-syphilis which develop is not greater than the number of patients which show positive serological findings at this time. As a corollary to this

[1] H. H. Young. *Manual of Military Urology.* Published for the American Expeditionary Forces by the American Red Cross, Paris, 1919.

statement, I further believe that if, before a patient is discharged as cured, his spinal fluid is found to be normal, he will never develop paresis or other forms of neuro-syphilis. There is, of course, no proof as yet available that this hypothesis is correct. It will require a good many years of observation before a definite statement of this kind can be made. It is, however, a good working hypothesis and up to this time I have never seen a case of neuro-syphilis develop in a patient with negative spinal fluid after the first or second year of his infection."

"When involvement of the fluid does occur in the secondary period of the disease it is much more amenable to treatment than in old cases where the infection has occurred many years previously. I believe that neuro-syphilis is due to a special strain of spirochete which may have invaded the fluid during the most intensive administration of mercury and salvarsan. In these cases it is only possible to reach the infection by intraspinal treatment. I have had a number of cases of very intense meningitis which developed a few months after infection shortly after the prolonged use of salvarsan and mercury. These patients are now entirely cured both clinically and serologically by intraspinal treatment."[1]

Meningitic Type.—This type is apt to occur comparatively early in the course of syphilis, as a rule within five years after the initial lesion. Its onset is usually rapid, the symptoms reaching complete development in two or three weeks. Anatomically it is characterized by a subacute diffuse meningeal inflammation, most marked at the base or even limited to that region, with occasional miliary gummata; the pial blood vessels are the seat of more or less widespread and more or less pronounced endarteritis; the process may subside in one area while extending to another, thus producing a peculiarly varying clinical picture.

The *symptoms* are physical and mental. The physical symptoms, in order of importance, are headache, dizziness,

[1] J. H. Fordyce, in a personal communication, dated May 8, 1918.

vomiting, convulsions, and evidences of cranial nerve involvement—amaurosis, ptosis, strabismus, facial neuralgia, hyperæsthesia or anæthesia, facial paralysis, impairment of the sense of smell, and possibly deafness; the pupillary reaction to light and distance may be sluggish or limited in excursion, but the Argyll-Robertson sign is generally absent; a spastic and partly paralytic condition of the lower extremities with increased knee jerks and bilateral or unilateral Babinski sign is often found. The mental symptoms are also very important. "A very characteristic sign of basic syphilitic meningitis is the semi-somnolent, semi-conscious, semi-comatose condition, in which the mental functions are more or less obfuscated rather than obliterated. The patients may present a lethargic, typhoid, or semi-intoxicated condition, from which they can be temporarily roused—a condition which is, however, frequently combined with a purposeless, hazy motor delirium, not of a purely automatic character. Even in the lesser degrees of obnubilation of consciousness, there are certain criteria of special significance; thus a patient may be roused to more or less correctly answer questions in a slow, drawling, dreamy, sleepy manner. He may even perform complex acts in response to requests or demands, yet be unable to respond to the calls of nature, and he passes urine and fæces in the bed, or evacuates his excreta in the room. Occasionally the patient may shamelessly masturbate. The mind may again become clear and he may regain control, but not infrequently this loss of control over the sphincters persists, and this denotes usually a permanent state of dementia. The dementia of syphilitic brain disease is characterized by being partial and recurring in attacks; it does not alter the character and personality of the individual to the same extent as in the dementia of general paresis. He preserves his autocritical faculties and is conscious of his intellectual deficit, and he is by no means indifferent to his mental and bodily condition. He may suffer with loss of memory, especially of recent events, and his knowledge of time and place may be defective.

He is subject to sudden fits of excitation with motor restlessness or of depression with suicidal tendencies." [1]

Gummatous Type.—This type is comparatively infrequent. It is characterized anatomically by the presence of one or more large gummata originating in the meninges and extending into the brain substance. The physical symptoms are apt to be those of brain tumor together with hemianopsia, aphasia, convulsions, hemiplegia, etc., according to the location of the gummata. The mental symptoms are much like those of the diffuse meningitic type.

Endarteritic Type.—This is perhaps the commonest type of cerebral syphilis, especially if we take account of the circumstance that many cases are difficult to distinguish from cerebral arteriosclerosis and are often classified as such. The clinical manifestations are, in fact, essentially those of cerebral arteriosclerosis. Even *post mortem* the differentiation cannot always be made with certainty; the characteristic finding in cerebral syphilis is a proliferative endarteritis accompanied by more or less marked lymphoid and plasma-cell infiltration of the adventitial sheaths and, perhaps, patches of similar infiltration in the pia.

Various combination-forms of the three above-mentioned types of cerebral syphilis are found in practice.

Diagnosis.—Cerebral syphilis often has to be differentiated from brain tumor, general paralysis, and cerebral arteriosclerosis.

In cases of brain tumor the presence of the cardinal symptoms and focal symptoms and the absence of lymphocytosis in the cerebro-spinal fluid and of the Wassermann reaction both in the blood and in the fluid will exclude cerebral syphilis.

When the clinical differentiation from general paralysis is uncertain, some help may be gained from an examination of the cerebro-spinal fluid; the Wassermann reaction is

[1] F. W. Mott. *Syphilis of the Nervous System.* A System of Syphilis, edited by D'Arcy Power and J. K. Murphy, Vol. IV. London, 1910.

positive in from 75 to 90% of cases of general paralysis and in but 30 or 35% of cases of cerebral syphilis;[1] in the latter condition it is most apt to be positive in cases of the meningitic type and negative almost as a rule in the gummatous and endarteritic types; lymphocytosis is almost invariably present in general paralysis, the usual finding being from 15 to 50 cells per cubic millimeter, while in cerebral syphilis it is inconstant and extremely variable in degree, being very often slight or absent in the gummatous and endarteritic types and as a rule extremely marked in the meningitic type—from 100 to 1500 cells or more per cubic millimeter;[2] the typical reaction obtained in the colloidal gold test in cases of general paralysis is not apt to be obtained in cerebral syphilis, there being, instead, as a rule, but a slightly marked precipitation in the first one or two tubes, a mere change of color in the next two or three, a more intense reaction again in the next one, two, or three tubes, and no change at all in the remaining ones—3321122200.[3]

The test of treatment is of value in many cases, improvement or recovery under salvarsan or mercury and iodides with reduction or disappearance of the lymphocytosis indicating cerebral syphilis and not general paralysis.

In cerebral arteriosclerosis the findings in the cerebrospinal fluid are negative, so that a difficulty in differentiation arises only in connection with those cases of the endarteritic type of cerebral syphilis in which the findings are likewise negative, and in such cases, as already stated, the differentiation cannot always be made with certainty even *post mortem*. A history of syphilitic infection will, naturally, turn the probability toward cerebral syphilis. The age of the patient may help in the differentiation: cases occurring in persons under forty-five are almost surely syphilitic;

[1] D. M. Kaplan. *Seralogy of Nervous and Mental Diseases.* Philadelphia and London, 1914, p. 191.

[2] D. M. Kaplan. *Lac. cit.*, p. 157.

[3] Swalm and Mann. *The Callaidal Gold Test on Spinal Fluid in Paresis and Other Mental Diseases.* N. Y. Med. Journ., Apr. 10, 1915.

in persons between forty-five and sixty the probability is still strongly in favor of syphilis; after sixty this probability diminishes with advancing senility.

Prognosis.—Cerebral syphilis is a grave affection; untreated cases progress more or less rapidly with tissue destruction and often a fatal termination. Treatment, however, if instituted early may result in a quick and perfect cure; the most favorable cases from this point of view are those of the meningitic type; cases of the gummatous type are often stubbornly resistant to treatment; in most cases of the endarteritic type recovery cannot be expected owing to the tissue destruction which occurs quickly, but much improvement may result from prompt and vigorous treatment.

CHAPTER XIV

SYPHILITIC DISORDERS (*Continued*)

PARENCHYMATOUS INVASION: GENERAL PARALYSIS

Synonyms.—Chronic arachnitis and chronic meningitis (Bayle). Incomplete general paralysis (Delaye). General paralysis of the insane or chronic diffuse periencephalo-meningitis (Calmiel). Paralytic insanity (Parchappe). Progressive general paralysis (Lunier, Sadras). Paralytic dementia (Baillarger). Chronic diffuse interstitial encephalitis (Magnan). *In German:* Progressive allgemeine Paralyse. In general it is convenient to employ the Latin term *dementia paralytica.*

The earliest mention of the somatic and psychic disorders corresponding to general paralysis dates back to 1798, when Haslam, pharmacist at the Bethlehem Hospital, described in a few lines and with remarkable precision the principal features of the disease.

It was only in 1822, thanks to the memorable work of Bayle, that general paralysis gained a footing in classical psychiatry. The history of this disease is a subject much too vast for the limits of this work. It has been quite thoroughly treated by Vignaud[1] in his inaugural thesis, which contains also a good bibliography.[2]

[1] *Histoire de la paralysie générale.* Paris. Thèse.

[2] Monographs on general paralysis: Lasègue. *De la paralysie générale progressive.* Th. d'agrég. Paris, 1853; also *Leçons sur la paralysie générale,* 1883.—Falret. *Recherches sur la folie paralytique et les diverses paralysies.* Paris, 1853.—Voisin. *Traité de la paralysie générale.* 1879.—Baillarger. *Théorie de la paralysie générale.* Ann. méd. psych., 1883—Mendel. *Die progressive allgemeine Paralyse der Irren,* 1880.—Mairet et Vires. *De la paralysie générale.* Etiologie. Pathogénie, Traitement, 1893.—Magnan et Sérieux. *La paralysie*

Prodromal Period.—It is marked (*a*) by changes of affectivity and character; (*b*) by neurasthenic and psychasthenic phenomena.

(*a*) The mood becomes either irritable and changeable, with sudden alternations of joy and sorrow, kindness and anger, discouragement and optimism; or gloomy and marked by pessimism and by a *tædium vitæ* which may lead the patient to attempts of suicide. Often the patient is conscious of being stricken with a grave disease and has dark presentiments for the future.

(*b*) The *neurasthenic* and *psychasthenic* symptoms are usually very pronounced: a feeling of general lassitude, fatigue, muscular weakness, diffuse neuralgic pains, headache, a sort of grinding sensation felt especially in the head, and other peculiar sensations which the patient is unable to describe clearly: it may seem to him that his head is empty, that his brain is falling to pieces, etc.

These symptoms are, however, not identical with those of true neurasthenia. The following are, according to Ballet, the most important points of difference:

" (1) The stigmata, that is to say, the permanent signs of neurasthenia (helmet sensation, pain in the spine), are usually absent.

" (2) Neuralgic pains occupy a prominent place in the clinical picture. These pains (excluding the lightning or lancinating pains dependent upon spinal lesions) are disseminated, essentially mobile, varying from day to day. The patients often speak of them as '*pains that are peculiar, unusual.*'

" (3) From one moment to another sudden changes are produced in the state of the patient. . . . It is surprising

générale (collection Léauté), 1894.—Coulon. *Considérations sur la nature de la paralysie générale.*—Klippel. *Les paralysies générales.* L'œuvre médico-chirurgicale, 1898.—For a bibliography of general paralysis, see G. Ballet and J. Rogues de Fursac. Article *Paralysie Générale* in Traité de Médecine Charcot-Bouchard-Brissaud. Paris, 1905.—E. Kraepelin. *General Paresis.* Eng. trans. by J. Moore. Nerv. and Ment. Dis. Monograph Series. New York, 1914.

to see the neurasthenic paretic, who but a short time before complained of severe suffering and ill health, forget his pains under the influence of some incident or conversation in which he is interested and in which he takes an active part. These momentary changes, appearing at the instance of chance occurrences, may manifest themselves in a more lasting manner on instituting some treatment, though insignificant. The patient, hitherto excessively discouraged and gloomy, speaks with joy of his cure; his satisfaction is exuberant and out of proportion, as was his despair shortly before."

Often some transient phenomenon, exceptional or unknown in neurasthenia, alarms the physician: slight seizures, transitory strabismus with diplopia, slightly marked momentary disorders of speech.

The period of prodromata is seldom absent. It is often long, lasting several months or years.

§ 1. Essential Symptoms

It will be necessary to consider these apart from accessory and inconstant symptoms, by the presence of which they are often masked.

The essential symptoms are:

(A) Mental deterioration;

(B) Disorders of motility;

(C) Pupillary disturbances;

(D) Changes in general nutrition.

(A) **Mental Deterioration.**—It presents two fundamental characteristics:

(1) It affects all the psychic functions in their *ensemble;*

(2) It is progressive, and usually rapidly so. This latter characteristic distinguishes paralytic dementia from senile dementia, the development of which is much slower.

Let us analyze rapidly the elements constituting this mental deterioration.

(*a*) *Memory.*—It is profoundly affected from the beginning. The amnesia is both *anterograde*, by default of fixation,

and *retrograde*, by destruction of impressions. It is *essentially incurable.*

The disappearance of old impressions probably follows the law of amnesia; but its course is so rapid that it is difficult to demonstrate this fact. The impressions of youth and childhood become very rapidly effaced, so that after a relatively short period only a few confused and distorted recollections remain in the mind of the patient, and these are only with great difficulty recovered from the general wreck.

(*b*) *Consciousness and Perception.*—Their disorders are manifested by:

(I) More or less complete loss of *orientation* in all its forms;

(II) More or less confused perception of the external world.

The clouding of consciousness and the confusion attain in the terminal period, and in certain forms in the beginning, an extreme intensity.

(*c*) *Attention and Association of Ideas.*—The attention of the patient is difficult to rouse as well as to fix. In some cases early in the disease, in phases of excitement, there may be flight of ideas. This, however, is of exceptional occurrence; as a rule there is sluggish formation of associations of ideas demonstrable by psychometry or by an ordinary clinical examination. In the cases in which some mental activity is still possible there is rapid mental fatigability, so that the patient is no longer able to do mental work of any complexity; in advanced stages even the simplest intellectual operations are impossible.

(*d*) *Affectivity.*—Its changes are characterized by morbid *indifference* and *irritability*, associated in the manner already described.[1] Both the indifference and the irritability are apt to be very marked. The general paralytic takes no interest in his own business or in the welfare of his relatives.

[1] See Part I, Chapter IV.

Grave occurrences fail to impress him. On the other hand, he is subject to fits of terrible anger on the slightest provocation.

The *moral sense* and *regard for conventionalities* disappear entirely. The patient commits the most ridiculous and most revolting acts with perfect serenity and is astonished when his liberty of action is interfered with.

(*e*) *Judgment.*—Its disorder finds expression in the patient's total lack of insight into his condition. Together with the amnesia, it explains the inconsistencies in the patient's conduct and speech; he is unable to appreciate the most flagrant contradictions. To a given question he gives the first answer that enters his mind, whether it happens to be false or correct, absurd or plausible.

(*f*) *Reactions.*—As might be expected, they are always *impulsive.* The reflections, that is to say the series of associations preceding the act, become more and more reduced. As the patient sees what he wants he immediately takes it. He wants an object that he sees exposed for sale in a shop—he takes it and carries it off without taking the trouble to pay for it. A paralytic leaning over the parapet of a bridge drops his cane. To recover it, reasoning that a straight line is the shortest distance between two points, he jumps after it into the water. Stereotyped movements (movements of sucking, grinding the teeth, etc.) and negativism are frequent. Cataleptoid attitudes are occasionally seen.

(B) **Motor Disturbances.**—The fundamental motor disturbances, the only ones that need occupy us here, are three in number: (*a*) Progressive muscular weakness; (*b*) Tremors; (*c*) Motor incoördination.

(*a*) *Muscular Weakness.*—It is most marked in the latter periods of the affection, when it accompanies the general cachexia. It involves all the muscles and is associated with more or less pronounced atrophy so that there is more or less complete disability.

(*b*) *Tremors.*—Unlike the muscular weakness, these

constitute an early symptom. They are of two kinds: fibrillary tremors and tremors *en masse*.

(I) The fibrillary tremors consist in rapidly repeated contractions of very small groups of muscular fibers. It is a sort of twitching. It is observed chiefly in the tongue and in the peri-buccal muscles.

(II) Tremors *en masse* usually appear as coarse oscillations, irregular in frequency and in amplitude. They become evident on voluntary movements and form a sort of point of transition between true tremors and muscular ataxia. They are seen especially in the upper extremities and in the tongue. The tongue projected from the mouth executes to-and-fro movements very aptly described by Magnan as "trombone movements."

(*c*) *Motor Incoördination.*—This first becomes evident in the most delicate movements and manifests itself early by impairment of *speech* and *handwriting*.

I. The *impairment of speech*, clearly apparent in advanced stages, is sometimes difficult to notice at the beginning and becomes evident only on resorting to special tests, such as prolonged reading in a loud voice or the pronunciation of test-phrases: Methodist Episcopal; fourth cavalry brigade, national intelligence, etc.

Sometimes the impairment of speech becomes less evident or even disappears temporarily during excitement. Often it becomes accentuated after apoplectiform or epileptiform attacks.

It is of various types, the principal of which are the following:

(α) Drawling, tremulous, indistinct speech;

(β) Scanning speech analogous to that of disseminated sclerosis;

(γ) Hesitating speech: the patient stops in the middle of a word and seems to hesitate before finishing it;

(δ) Omission of one or more syllables: the patient pronounces, for instance, "Methist Pispal" instead of Methodist Episcopal;

(ε) Reduplication of one or of several syllables, as "constititutional";

(ζ) Interchange of syllables: "constutitional."

These types may be combined so as to form mixed types of infinite variety.

II. The *handwriting* is characterized by its irregular appearance, and by the coarse tremors seen in the strokes. These motor disorders are always associated with phenomena of intellectual origin: omissions, or, on the contrary, repetitions of letters, syllables, or words, numerous glaring orthographical errors. All these features impart to the handwriting of general paralysis its characteristic aspect.

Usually the patient is totally unconscious of these symptoms. If accidentally he notices them, he is neither surprised nor alarmed. The explanations which he gives are childish: he does not speak well because he has lost a tooth, or he writes with difficulty because his hands are cold.

Slight in the beginning, the impediment of speech and the impairment of handwriting become progressively aggravated, so that in the terminal stage of the disease the writing becomes shapeless scribbling and the speech unintelligible stammering.

At the end of the disease it is almost constant to note *disturbance of deglutition* caused by paresis and incoördination of the pharyngeal muscles, which may entail death by suffocation.

(C) **Pupillary Disorders.**[1]—These appear sometimes very early.

They are dependent upon an *internal ophthalmoplegia of gradual and progressive development* (Baillet and Bloch), which is manifested by changes in the shape, size, and reactions of the pupil.

(*a*) *Changes in Shape.*—The pupil loses its circular shape and becomes oval or irregular. This symptom seems to be frequent, but of its diagnostic value little is known.

[1] Mignot. *Contribution à l'étude des troubles pupillaires dans quelques maladies mentales.* Thèse de Paris, 1900.

(*b*) *Changes in Size.*—These are of three kinds:

I. *Myosis,* at times so marked that the pupils are reduced to pin-hole size.

II. *Mydriasis,* also very well marked in some cases.

III. *Inequality,* which may be produced by three different mechanisms:

(α) One pupil is normal, the other myotic or mydriatic;

(β) One pupil is mydriatic, the other myotic;

(γ) Both pupils are mydriatic or myotic, but are unequally dilated or contracted.

It is important, in order to make a satisfactory examination of the pupils, to place the patient in such a light that both eyes receive an equal amount of illumination. It is also important to vary the intensity of illumination, because an inequality that appears doubtful in a strong light may become very evident in a weaker light, and *vice versa.*

Pupillary inequality is sometimes congenital. Moreover, it is encountered in many affections other than general paralysis: dementia præcox, compression of the sympathetic nerve, etc.; therefore, it does not by any means constitute a pathognomonic sign.

(*c*) *Changes in the Reflexes.*—These consist in changes in the *light reflex,* or the *accommodation reflex,* or both. They are either binocular or monocular.

Disorders of the pupillary reactions may be associated as in the Argyll-Robertson type: abolition of the light reflex with persistence of the accommodation reflex. This combination is, however, considerably less frequent in general paralysis than in tabes.

At the beginning of the disease the reactions are not completely abolished, but are simply paretic.

It is not uncommon for the speech defect and the pupillary signs to persist through complete mental remissions.

(D) **Changes in General Nutrition.**—Though constant and very important they have thus far received but little attention. Clinically we find changes in weight and in the urinary secretion.

The onset is almost always marked by considerable loss of weight. Later the weight varies with the clinical form.

In the excited and depressed forms of rapid evolution the loss of weight is marked and progressive, and the patient rapidly becomes cachectic.

In the expansive or demented forms the weight often rises after the initial fall, the patient then becoming corpulent and remaining so until the terminal stage, when the weight may fall suddenly and continue to drop as marasmus is established.

Organic crises may be noted in the course of the disease (Arnaud); they consist in transitory but considerable loss of weight, the cause of which is unknown.

The changes in the urinary secretion indicate general sluggishness of nutrition. They have been especially studied in connection with the second period of the disease. The principal ones are polyuria, low specific gravity of the urine, slight albuminuria, very considerable diminution of urea and of phosphates, and increase of chlorides.[1]

A study of the blood changes might also be of great interest. The work already done along this line is unfortunately very scant and inconclusive. Capps [2] found a slight diminution of hæmoglobin and of the red blood cells.

§ 2. Inconstant Symptoms

Many symptoms, though not constant are, however, frequent and important.

This group comprises:

(A) Mental disorders;

(B) Motor disorders;

(C) Disorders of the reflexes;

(D) Disorders of sensation;

[1] Klippel et Serveaux. *Contribution à l'étude de l'urine dans la paralysie générale.* Congrès des médicins aliénistes et neurologistes, 1895.

[2] *American Journ. of the Med. Sc.*, 1896, No. 290.

(E) Trophic disorders;

(F) Visceral disorders;

(G) Epileptiform and apoplectiform seizures.

(A) **Mental Disorders.**—The principal are delusions and hallucinations.

(*a*) The *delusions* of the general paralytic are of the demented type; that is to say, they are *absurd, mobile, multiple,* and *contradictory.*

They assume all forms;

(α) *Ideas of grandeur:* the patient is immensely rich; millions are not adequate, the general paralytic counts his riches by trillions; he governs the forces of nature, resuscitates the dead, is the incarnation of all the great men of the present and of the future, destroys and reconstructs the universe by a single gesture, etc.

(β) *Melancholy ideas:* ideas of culpability: one patient accused himself of having hastened the end of the world by ten thousand centuries; hypochondriacal ideas: another patient refused to eat because he had "a bicycle manufactory in the throat"; ideas of negation: the organs are liquefied or replaced by air, the body is nothing but a putrefied corpse; ideas of ruin analogous to those of melancholia.

(γ) *Persecutory ideas:* they are either primary or secondary to ideas of grandeur. In the latter case the patients complain that they have been robbed of their immense fortune, that they are not treated with the respect to which they are entitled, that they are unjustly detained in the institution, etc. Occasionally at the beginning persecutory ideas become systematized,[1] but always imperfectly. A close examination always reveals certain flagrant contradictions by which the mental deterioration manifests itself.

(*b*) The frequency of *hallucinations* in general paralysis is a much disputed question. Some authors believe that they are almost constant (Christian and Ritti), or at least frequent (Wernicke); others claim that they are rare (Magnan,

[1] Magnan. *Leçons cliniques.*

Dagonet, Krafft-Ebing). The latter opinion is the more widely accepted and I believe the more correct one.

The hallucinations may affect any of the senses, including the muscular sense.

Illusions are much more frequent than hallucinations.

Psycho-sensory disorders are encountered chiefly in the excited form of general paralysis, in which they are associated with incoherent delusions.

The systematized persecutory delusions which are occasionally met with are apt to be associated with auditory hallucinations.

As in all cases of pronounced dementia, the reactions and the emotional tone do not always harmonize with the delusions. A general paralytic who believes himself to be dead may eat heartily and remain otherwise unaffected.

The following case illustrates the type of delusions in general paralysis:

Marie B., thirty-two years old, café singer.—Family history unknown.—Patient occasionally drinks to excess. Syphilis very probable, as patient has lived for some years with a man who had syphilis. She had two still-births.—She was arrested for creating a disturbance on a public thoroughfare and was sent to the Clermont Asylum. On the way to the asylum she was greatly excited, spoke of her immense fortune, distributing millions among those about her, made indecent signs to all the men she met, but submitted readily to being taken to the asylum.

Two days after her arrival at the asylum, at the time that this record was made, the patient showed marked excitement. Her face was red, her eyes sparkling. She was very voluble, yet quite tractable. Her orientation was very imperfect, delusions extremely active. She said that she was in a town called Clermont, and that she had been there three months; that it was the spring of 1894 (in reality March, 1904); that the institution she was in was a hospital for wounded soldiers. It was pointed out to her that there were no soldiers there. " That is true," she said, " they are in Nice. I take good care of them. I do not put them in a dungeon, but in a beautiful room." She knew at once that there were insane patients in the asylum, but there are no longer to be any there, as to-morrow she is going to cure them all with a good cathartic. She had already cured her husband " of a filthy disease by cleaning out his bowels." This husband of hers married the

daughter of a colonel who left him two days after the wedding. The patient states that she herself had also been sick; sbe was operated on by Duchess de C., then went for six months without making water or moving her bowels, but she was never sick enougb to go to bed, neither were her horses. She has ten thousand race horses that can make twelve hundred miles an bour without getting out of breath. The proof is that they went from Paris to Marseilles in four and a half hours. She is very wealthy, she has a million francs. When it was pointed out to her that a million is not so much, she said she had made a mistake she should have said thirty million francs. At any rate it is going to be increased to one hundred and fifty million this week. All this fortune came to her by inheritance. She also has several hundred mansions which she will convert into hospitals. Everybody around her shall be happy. The nurse who is taking care of her shall receive a bospital, a mansion, three broughams, a landau, two thoroughbred horses, male and female, so that they may have young ones, a race track, an angora cat, and an estate with cultivated grounds. Another patient struck her without provocation; " That's nothing! She shall have her little million like everybody else, just the same, also a suit of man's clothes in which she can follow the regiments."—She has two boys, " each twenty years old "; she herself is twenty-five years old. She bad ber first child at the age of twelve. She states that she drinks a good deal. In all the towns through which she passed the station-masters and those in charge of provisions gave her the key to their wine cellar in order that she migbt help herself at her pleasure. When asked whether she could drink ten quarts of wine a day, she exclaimed: " Ten quarts! a good deal more, at least a barrelful, for I drink a quart with every meal." Her memory is greatly impaired; what little correct information the patient gives is lost in the multitude of disconnected pseudo-reminiscences.—*Physical signs:* Distinct speech defect shown in her spontaneous utterances as well as by test words. The pupils show scarcely any reaction to light; they react to accommodation readily. Marked hyperæsthesia over entire surface of the skin; the slightest pricking with a pin causes marked pain. For several minutes during tbe examination simple contact brought fortb piercing cries. Considerable loss of flesh.

(B) **Motor Disorders.**—The most frequent are *phenomena of paralysis and of paresis,* which may assume the most varied types: monoplegia, hemiplegia, facial paralysis. The latter, generally slight, constitutes a very frequent and often an early symptom.

The paralysis is either flaccid or associated with contractures.

A certain degree of motor aphasia is often observed.

Paralysis in many cases follows a seizure and is usually transitory.

Convulsions will be considered in connection with epileptiform seizures.

Sometimes choreiform movements are observed in general paralysis (Vallon and Marie), also tremors analogous to those of multiple sclerosis and of athetosis.

(C) **Disorders of the Reflexes.**—The best known and the most important are the changes in the *patellar reflex.*

There is nothing constant about these, as they vary not only in different patients but also in the same patient at different times.

The patellar reflexes may be *normal, exaggerated, diminished,* or *abolished.* Sometimes they are *unequal* on the two sides: one may be exaggerated, the other abolished.

Complete abolition is seen in the tabetic form, exaggeration in the spastic form.

Other tendon reflexes have been but little studied. It has been noted that exaggeration of deep reflexes is generally more marked in the upper extremities.

As to cutaneous reflexes, they are sometimes exaggerated, more often abolished. The Babinski sign is present only in cases with lesions of the pyramidal tracts, especially in those with combined sclerosis.

(D) **Disorders of Sensation.**—These have been well described by Marandon de Montyel, from whom the following facts have been borrowed:

(*a*) *Sensibility to pain* is often diminished, less frequently abolished, rarely exaggerated. Some patients present retardation of the perception of pain. Disorders of pain sensibility often persist during remissions.

(*b*) *Tactile sensibility* is usually normal. However, there may be hyperæsthesia, hypoæsthesia, and even complete anæsthesia. These disorders disappear during remissions.

(*c*) *Special senses:* disorders of hearing (more or less marked deafness, tinnitus, etc.) are not infrequent, but by

reason of their eommon oceurrenee in other mental disorders and in normal individuals they are of but slight importanee.

In some eases, however, the deafness is of eentral origin and seems to be directly due to the meningo-encephalitis. Reeently I had under my observation a paretic who developed bilateral deafness following an apoplectiform attack. At first his deafness was remittent; on some days the patient eould hear fairly well, while on other days he understood what was said to him only by the movements of the lips and, of course, but very imperfectly. Now his deafness is complete.

Amblyopia or even complete *amaurosis* is sometimes eneountered. In certain cases it depends upon atrophy of the optie nerve.

The senses of taste and smell are often greatly impaired.

Disorders of the generative function are quite frequent and vary with the stage of the disease.

The onset is often marked by *genital excitation,* whieh, assoeiated with the mental deterioration, may lead to indeeent or criminal acts: exhibitionism, rape, etc. Later this excitation is replaced by absolute *impotence.*

(E) **Trophic Disorders.**—These affect all the tissues.

Osseous tissue: abnormal fragility of the bones, fractures eaused by slight traumatisms or even occurring spontaneously.

Connective and cartilaginous tissues: the trophie disorders are here ehiefly manifested by *hæmatoma auris,*[1] whieh eonsists in an extravasation of blood into the tissues of the auricle.

The exaet seat of the extravasation in *hæmatoma auris* is still a disputed question. Some are of the opinion that it is in the subeutaneous tissues, others believe that it is between the cartilage and the perichondrium, and still others think that it is within the cartilage itself.

Manifestations of trophie disorders are usually favored

[1] Gatian de Clérambault. *Contribution à l'étude de l'othématome.* Thèse de Paris, 1899.

by traumatisms. It must not be forgotten that the great majority of *hœmatomata auris* are on the left side and that when one receives a blow it is usually on that side. It is possible to reduce considerably the number of *hœmatomata* in institutions by holding the attendants directly responsible for their occurrence.

Skin.—Deformity and grooving of the nails,[1] diverse eruptions, *herpes.* The latter lesion indicates involvement of the cord in the pathological process; it may constitute one of the first symptoms of the disease.

The most frequent and most grave cutaneous disturbances are *pressure-sores.*

Whether bilateral or unilateral they develop chiefly at the points bearing the weight of the body while the patient is in bed; hence the sacral, gluteal, and trochanteric bed-sores. The sacral bed-sore is very often median.

In their *dimensions* they vary from small sores of the size of a dime to those exceeding the size of the palm of the hand.

Their *depth* also varies in different cases. Some remain superficial, while others destroy the skin, subcutaneous tissue, and muscles, and expose the bone.

Their *course* is often progressive; that is to say, they increase in extent and in depth. Sometimes they heal under the influence of appropriate treatment.

Muscles.—Localized muscular atrophy is rare. It affects different groups of muscles and may have one of two origins, resulting either from degeneration of the white columns of the cord, which, in its turn, is caused by cerebral lesions (Grellière),[2] or from primary degeneration of the cells in the anterior horns (Joffroy).[3]

[1] Trèves. *Su alcani alteretzioni distrophiche delle unghi.* Rivist. di clin. medic., 1899, No. 6.

[2] Grellière. *Atrophie musculaire dans la paralysie générale des aliénés.* Paris, 1875.

[3] Joffroy. *Contribution à l'anatomie pathologique de la paralysie générale.* Congrès de Médecine mentale, 1892.

(F) **Visceral Disorders.**—These are dependent either upon the disease itself or upon a complication. It is unfortunately difficult to determine in any given case what the real cause is.

(*a*) *Digestive apparatus:* Its functions become disturbed chiefly in the terminal stage of all forms, and early in the depressed and excited forms: anorexia, vomiting, constipation, or intractable diarrhœa. In the expansive form one often notes a veritable boulimia.

(*b*) *Cardio-vascular apparatus:* Evidences of atheroma, myocarditis, rapid and feeble pulse in the terminal cachexia. Aortic insufficiency is not rare and is probably due to syphilis.

(*c*) *Kidneys:* Slight albuminuria is frequent. This with the low specific gravity of the urine is an indication of a certain degree of renal insufficiency.

(*d*) *Liver:* Sometimes hypertrophied, more rarely atrophied with phenomena of cirrhosis. The ascites that usually accompanies atrophic cirrhosis of the liver is generally absent in the cirrhosis of general paralysis (Klippel).

(*e*) *Respiratory apparatus:* Congestion, broncho-pneumonia, and splenization are frequent complications of the last stage. Pulmonary tuberculosis is, on the contrary, quite rare and usually runs a slow course (Bergonié, Klippel.)

(G) **Seizures.**[1]—These are frequent, occurring at all periods of the disease and often marking the onset. They may be fatal. According to Arnaud death from a seizure is the natural mode of termination of general paralysis. They are often accompanied by elevation of temperature which is at times considerable. In some cases more or less marked albuminuria is observed, which disappears several hours or several days after the seizure.

On recovery from these seizures, which is most usual, symptoms of apoplexy (paralysis, aphasia) often appear; they are almost always transitory, there being no gross

[1] Pierret. *Les attaques épileptiformes et apoplectiformes dans la paralysie générale.* Progrès médical, 1897.—Arnaud. Arch. de neurol., 1897.—Bonnat. Thèse de Paris, 1900.

lesions of the corresponding projection-centers. The seizures are generally followed by an aggravation of the fundamental psychic and physical symptoms.

The seizures are of two kinds: *apoplectiform* and *epileptiform.*

The former are characterized by more or less complete loss of consciousness associated with complete flaccidity of the limbs.

The latter consist in *general* or *localized* convulsions. The general convulsions sometimes so closely simulate epilepsy as to be mistaken for it. The localized convulsions assume the aspect of Jacksonian epilepsy (monocrural, monobrachial, facial). The loss of consciousness accompanying the partial convulsions is either complete or reduced to a slight degree of confusion, as in the case of convulsions due to focal lesions, such as cerebral tumor and the like.

§ 3. Forms. Evolution. Diagnosis

The principal forms of general paralysis are:

(A) Demented form;
(B) Expansive form;
(C) Excited form;
(D) Depressed form;
(E) Spinal forms { tabetic; spastic.

A. **Demented Form.**—This form constitutes from the psychic standpoint the pure type of general paralysis, free from accessory symptoms.

The *onset* is marked chiefly by *indifference* and *loss of memory.*

When the disease is fully established the symptoms are those of profound mental deterioration, which we have already described, associated with the characteristic physical disorders.

This form is frequent; its *evolution* is rapid and not interrupted by remissions.

B. **Expansive Form.**—Also frequent.

Special features:

Euphoria, often very marked.

Effusive benevolence, interrupted by transitory outbreaks of anger.

Ideas of self-satisfaction and ideas of grandeur (hallucinations are very rare).

Excitement, loquaciousness.

The disease begins with a morbid activity and slight excitement, which, associated with disorders of judgment, often lead the patient to ruinous deeds, misdemeanors, and even crimes. Unnecessary purchases, absurd enterprises, violations of decency, rape, and swindling are common. It is this stage that constitutes chiefly the medico-legal period of general paralysis.

The *evolution* of this form is slow. The duration of the illness quite frequently exceeds three years. Remissions are frequent.

C. **Excited Form.**—This sometimes begins with a state of excitement and confusion resembling mania or acute confusion.

Its special features are:

Complete loss of orientation in all its forms;

Incoherent delusions, usually associated with numerous hallucinations;

Violent reactions with very marked motor excitement;

Profound disturbances of general nutrition.

It may run one of two possible *courses:* the excitement may persist and death supervene within a few months or even weeks (galloping general paralysis); or the excitement may subside and the disease may pass into one of the other forms—demented, expansive, or depressed.

D. **Depressed Form.**—The onset is marked by a state of depression, so that the trouble may be mistaken for involutional melancholia or for a manic-depressive attack.

The special features of this form are:

Psychic inhibition;

Psychic pain;

Melancholy delusions;

Attempts of suicide that are frequently childish and ineffective;

Peripheral vaso-constriction, impairment of general nutrition;

Refusal of food.

All these disorders, however, harmonize less perfectly with each other than in the constitutional depressive affections.

The *evolution* is very rapid. Death supervenes early, and is due to cachexia or to some complication (infection favored by the impaired nutrition and diminished resistance of the tissues).

E. **Spinal Forms.**—*Tabetic Form.*—This form has at the beginning the aspect of ordinary tabes. The signs of general paralysis appear much later.

Its special features are:

Lightning, lancinating pains; girdle sensation;

Marked ataxic symptoms;

Abolition of the patellar reflexes;

Romberg symptom;

Argyll-Robertson pupils.

The symptomatology of this form of general paralysis is, however, not identical with that of pure tabes. The pains are less severe, the urinary troubles less frequent (Joffroy). A curious fact difficult to explain is that as the symptoms of general paralysis become more pronounced, those of tabes (at least the subjective symptoms) seem to disappear.

Spastic Form. (*Form with Lateral Sclerosis.*)—This form is characterized by muscular rigidity, exaggeration of reflexes and epileptoid trembling. The Babinski sign is almost constant. " These symptoms are sometimes bilateral and symmetrical, at other times unilateral, and still at other times, at the onset of the disease, mobile and variable." (Dupré.)

The different forms above described may follow each other, or they may be associated in the most varied ways.

Course and Prognosis.—The course of general paralysis is progressive, and has been schematically divided into three stages, not including the prodromal stage: (1) stage of onset; (2) stage of complete development; (3) stage of cachexia.

The symptoms at the *stage of onset* are very variable. Generally mental symptoms are the first to attract attention and even to suggest the diagnosis: disorders of memory and orientation; the patient loses his way in the streets with which he is most familiar, forgets on leaving the house what he started out for; there are also irritability, outbursts of anger, attacks of depression or of excitement with elation; more or less active delusions. These symptoms are not incompatible with a certain degree of mental activity; hence the anomalies of conduct leading to antisocial consequences which are at times very grave and which have led some (Legrand du Saulle) to designate this stage of the disease as its *medico-legal period.* The patient forgets the most common conventionalities and makes use of obscene language in public and in the presence of his own children. He enters upon foolish, ruinous enterprises, buys dozens of umbrellas, cases full of jewelry, hundreds of copies of the same book. One patient, formerly a notary, ordered in one day twelve tigers from Bengal, " tamed " in Hamburg, five thousand pounds of tar from Paris, and five hundred pounds of coffee from Port-au-Prince. Often a paretic will commit thefts and frauds, so childish in character as to suggest at once serious mental disturbance. Finally the patient's impulsiveness may lead to acts of violence, murder, and, when combined with genital excitation, as is often the case, to violations of decency and to rape.

In this stage the physical signs are generally not fully developed; yet it is rare for them to be entirely wanting.

The second stage, that of *complete development,* is the one in which the fundamental symptoms are well marked

and the delusions, if they exist, are in full bloom; yet the patient is still able to walk around and to eat and dress without assistance. There is in this stage as yet no loss of sphincter control except, perhaps, for occasional brief periods.

The *stage of cachexia* is characterized by complete physical and mental dilapidation, by the appearance of pressure-sores, and by permanent loss of sphincter control.

The *prognosis* is fatal. Death occurs from cachexia, from some complication, or as the result of an apoplectiform or epileptiform seizure.

The average *duration* of the disease is two or three years. There is, however, no fixed rule with regard to this. In exceptional cases the disease lasts but several months or weeks (galloping general paralysis); in other cases, on the contrary, it is prolonged for ten or more years.

The progress of the disease may be interrupted by *remissions*. Rarely, except at the beginning, are the remissions complete. Almost always the persistence of a certain degree of mental deterioration, or at least of a neurasthenic condition and of physical signs exclude any idea of true recovery.

Diagnosis.—The fundamental elements of diagnosis are progressive mental deterioration *en masse* and the characteristic physical signs.

General paralysis may, especially at the beginning, when neither the mental deterioration nor the somatic signs are well marked, simulate many other psychoses.

Lumbar puncture is here of great service. An increase in the number of lymphocytes in the cerebro-spinal fluid is almost constant in general paralysis, especially at the onset.

It is known that *lymphocytosis* of the cerebro-spinal fluid always indicates a meningeal inflammatory lesion. Though its existence does not point positively to general paralysis, yet it excludes all affections in which there are no meningeal lesions. Thus are eliminated: dementia præcox, involutional melancholia, manic-depressive psychoses, epilep-

tic psychoses, alcoholic psychoses, and exhaustion psychoses. Further, affections with a basis of a simple process of atrophy, like senile dementia, or with a basis of a central lesion without meningeal involvement (tumors of the centrum ovale, hemorrhages, cerebral softening), are also eliminated.

The cerebro-spinal fluid and the blood may also be examined for the Wassermann reaction, and a positive result will further narrow down the diagnosis to some syphilitic disorder.

Lange's colloidal gold test, applied to the cerebro-spinal fluid, gives a very characteristic reaction in general paralysis: complete precipitation in the first two, three, or four tubes, partial precipitation in the next two or three, and no precipitation at all in the rest, 5555432100. (See Appendix I.)

Noguchi's butyric acid test, the Ross-Jones ammonium sulphate test and Pandy's phenol test usually give a positive result in cases of general paralysis and a negative result in other psychoses. All forms of meningitis, however, also give a positive result.

In the great majority of cases in which general paralysis is suspected its existence can be either established or excluded with complete certainty with the aid of spinal fluid examination. There are, however, two groups of cases which may present extraordinary difficulties of differentiation; the first consists of psychoses essentially of a non-syphilitic nature occurring in combination with tabes: here one must rely mainly on the mental symptoms for the differentiation, although it has been said that the colloidal gold test here gives but seldom the typical reaction described above;[1] the second group consists of cases of cerebral syphilis: the differentiation of these has already been considered in the chapter devoted to that condition.

[1] D. M. Kaplan. *Serology of Nervous and Mental Diseases.* Philadelphia and London, 1914.—Swalm and Mann. *The Colloidal Gold Test on Spinal Fluid in Paresis and Other Mental Diseases.* N. Y. Med. Journ., Apr. 10, 1915.

PATHOLOGICAL ANATOMY—ETIOLOGY—TREATMENT

We shall describe separately the lesions of the encephalon, spinal cord, peripheral nerves, and viscera.

Pathological Anatomy.—A. **Encephalon.**—*Dura mater:* often congested, presenting occasionally the lesions of hemorrhagic pachymeningitis.

Pia-arachnoid and brain.

(*a*) Macroscopic lesions.

(1) *General atrophy of the brain,* most marked in the frontal and parietal lobes, and made evident by:

α. Flattening of the convolutions;

β. Thinning of the cortex;

γ. Diminution of the weight, most marked in cases of slow evolution, often slight or absent in cases of general paralysis of very rapid course.

(2) *Thickening of the pia mater and adhesions between it and the cerebral substance:* stripping off the pia causes a tearing away of the cerebral substance, espccially at the frontal and parietal lobes.

(3) *Arteritis of the large and medium-sized cerebral vessels:* this lesion is not a constant one.

(4) *Ependymal granulations:* the lining of the ventricles is thickly studded with translucent granulations, which are sometimes very minute, like a fine powder sprinkled over the surfacc, but more often coarser, resembling grains of granulated sugar. Ependymal granulations are fairly constant in general paralysis; outside of general paralysis they arc found only exceptionally.

(*b*) Microscopic lesions.[1]

(1) *Nerve cells.*—Their changes are:

α. In *numbers* and *arrangement:* many cells disappear;

[1] Ballet. *Les lésians cérébrales de la paralysie générale.* Ann. méd. psych., 1898.—Anglade. *Sur les altérations des cellules nerveuses dans la paralysie générale.* Ann. méd. psych., July–Aug., 1898.—Alzheimer. *Histalagische Studien zur Differentialdiagnose der progress. Paralyse.* Histol. u. histopathol. Arbeiten. Vol. I, 1904.

the different layers are more difficult to distinguish than in the normal state and appear to be confounded;

β. In *shape:* the processes disappear, the angles become blunted, the cell-body tends to reduce itself to a small, granular and pigmented mass;

γ. In *structure:* chromatolysis—that is, alteration and destruction of Nissl's corpuscles—which causes the cell to assume a hyaline aspect when the chromatic substance is destroyed, or to present a uniform coloration if stained by the aniline pigments when this substance, reduced to a fine powder, is disseminated through the entire cell.

(2) *Nerve-fibers:* many are destroyed, which fact can be demonstrated by Pal's or Weigert's hæmatoxylin stain. The degeneration affects projection fibers as well as association fibers, but more particularly the superficial tangential fibers of Exner-Tuczek.

(3) *Pia mater and blood vessels:*

α. The *pia mater is thickened,* infiltrated by nuclei representing proliferating fixed connective-tissue cells or migrating leucocytes.

β. The *blood vessels* are much more numerous than normally; the walls are thickened, often showing hyaline or fatty degeneration; the perivascular spaces are infiltrated with cells. The appearance of these lesions is similar to those of diffuse cerebral syphilis.[1]

Among the cells infiltrating the pia-arachnoid and the adventitial coats of the cortical vessels a special variety of cells occurs, known as *plasma cells,* which are of great importance in pathological diagnosis, since they are constant in general paralysis and are found, according to Nissl, in no other chronic psychosis. These cells are somewhat larger than the ordinary round cells, contain coarse, deeply stained granulations in their nuclei, and a relatively large amount of finely granular protoplasm which, in specimens fixed in

[1] Mahaim. *De l'importance des lésions vasculaires,* etc. Bullet. de l'Acad. roy. de Méd. de Belgique, July, 1901.

alcohol and stained with toluidin blue, takes a deep purple stain.

(4) *Neuroglia.*—Proliferation of neuroglia-cells is very frequently seen; when well marked it is especially prominent in the vicinity of the blood-vessels (Mahaim). Scantily distributed here and there may be seen spider-cells of abnormal shape and of gigantic size.

Among the most constant neuroglial changes must be mentioned the ependymal granulations already referred to above. These are found under the microscope to consist of irregular hillocks upon the lining of the ventricles, formed by great proliferation of the ependymal glia cells which, instead of consisting of a single layer, as they do normally, are in these hillocks piled up in half a dozen or more irregular layers.

(B) **Spinal Cord.**—(1) *Nerve cells:* degenerative and atrophic lesions identical with those of the cerebral cells.

(2) *Nerve-fibers.*—There are two principal types of lesions—the tabetic type and the type of combined sclerosis.

(*a*) *Tabetic type.*—The degeneration is localized in the posterior columns and is similar to the lesion of tabes: this has led many authors to look upon general paralysis and tabes as two different localizations of the same morbid process.[1]

(*b*) *Combined Sclerosis.*—The degeneration involves both the posterior and the lateral columns. Moreover, the process here is more diffuse and affects simultaneously different systems of fibers (tract of Gowers, crossed pyramidal tract).

(C) **Peripheral Nerves.**—The lesions of the peripheral nerves consist in the phenomena of neuritis and atrophy, analogous to those encountered in tabes and in alcoholism.

(D) **Viscera.**—Three classes of lesions may be distinguished in the viscera:

(1) Lesions occurring merely as accidental complications: various infections, broncho-pneumonia, tuberculosis. The latter is rare and usually runs a slow course.

[1] Nageotte. *Tabes et Paralysie générale.* Thèse de Paris, 1893.

(2) Lesions which are the direct consequences of the nervous disorders. These have been studied exhaustively by Klippel, who has termed them vasoparalytic lesions. They consist, according to this author, "in a high degree of congestion and capillary engorgement, capillary hemorrhages, and, by consequence, atrophic degeneration of epithelial tissues."[1]

(3) Diffuse vascular lesions identical in appearance with those of the cerebral vessels.

These lesions are met with chiefly in the kidneys, liver and heart, and are often associated with degenerative lesions, such as fatty or cirrhotic liver, sclerotic kidney, or degenerated myocardium.

Etiology.—In 1857 Esmarch and Jessen were led by the clinical histories of their cases to conclude that syphilis was the cause of general paralysis; but their view gained ground very slowly. In France Charcot always rejected it, and Déjerine wrote in 1886, "Syphilis is very rarely found in the histories of general paralytics, and has no influence on the course of the affection; when found it is but a coincidence."

Others have held, with Joffroy, that syphilis was a strong factor favoring the occurrence of general paralysis but not an essential cause of it.

Case histories alone were, naturally, insufficient to establish the essential part played by syphilis in the etiology of general paralysis, a history of syphilitic infection being by no means always obtainable; but the case came to be strengthened on anatomical grounds by the similarity between the lesions of general paralysis and certain syphilitic lesions.

In 1897 Krafft-Ebing presented at the International Congress of Medicine in Moscow further important evidence. A physician, whose name was not mentioned, inoculated

[1] Klippel. *Lésions des poumons, du cœur, du foie et des reins dans la paralysie générale.* Arch. de méd. expérim. et d'anat. path., July, 1892.—Angiolella. *Lésions des petits vaisseaux de quelques organes dans la paralysie générale.* Il manicomio, 1895, Nos. 2 and 3.

with syphilis nine general paralytics who had reached the last stage of the disease and in whose history syphilis had not been found; none of these developed a chancre.

The advent of the Wassermann reaction with the generally positive finding either in the blood, or in the cerebro-spinal fluid, or in both, led to the general acceptance of the view that in the absence of syphilis there can be no general paralysis. But the nature of the disease still seemed obscure; especially perplexing was its resistance to anti-syphilitic treatment in contrast with other syphilitic lesions. The disease was held to be a *consequence* and not a *direct manifestation* of syphilis, a "metasyphilitic" (Moebius) or "parasyphilitic" (Fournier) disorder, possibly in the nature of an autointoxication (Kraepelin).

Some, however, advanced the view, based on various considerations, that general paralysis was but a late and peculiar manifestation of still active syphilis.[1] Others, notably Lambert and Dunlap,[2] have insisted that a sharp line of demarcation cannot be drawn between general paralysis and cerebral syphilis and have brought to attention cases which, in clinical features as well as in *post mortem* findings, represent transition or combination forms.

The nature of the relationship between syphilis and general paralysis was finally settled by Noguchi and Moore,[3] who found the *treponema pallidum* in brain sections from

[1] Browning and McKenzie. *On the Wassermann Reaction, and Especially its Significance in Relation to General Paralysis.* Journ. of Mental Science, Vol. LV, 1909.—Plaut and Fischer. *Die Lues-Paralyse Frage.* Allg. Zeitschr. f. Psychiatrie, Vol. LXVI, 1909.—Rosanoff and Wiseman. *Syphilis and Insanity.* Amer. Journ. of Insanity, Jan. 1910.

[2] C. I. Lambert. *A Summary Review of the Syphilitic and Metasyphilitic Cases in* 152 *Consecutive Autopsies.* N. Y. State Hosp. Bulletin, Aug., 1912.—C. B. Dunlap. *Anatomical Borderline between the so-called Syphilitic and Metasyphilitic Disorders.* Amer. Journ. of Insanity, 1913.

[3] Noguchi and Moore. *A Demonstration of Treponema Pallidum in the Brain in Cases of General Paralysis.* Journ. of Exper. Medicine, Vol. XVII, No. 2, 1913.

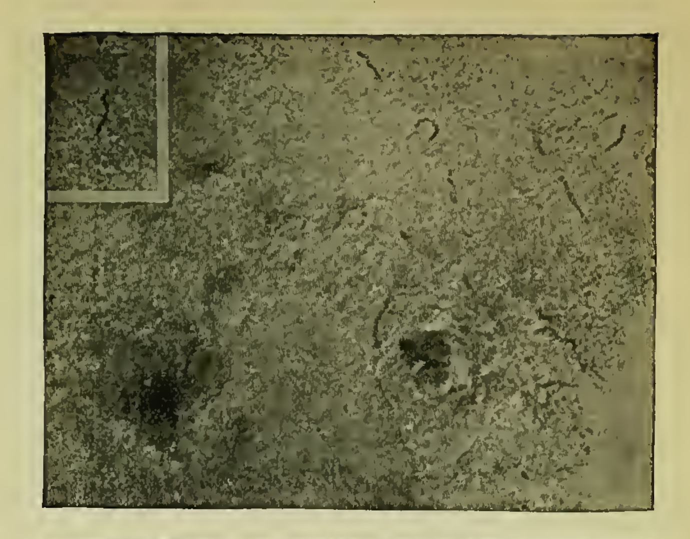
twelve out of a total of seventy cases of general paralysis examined by them. This finding has since been confirmed by many observers, so that general paralysis is now regarded as a lesion of syphilis affecting the brain and differing from other intracranial syphilitic lesions by the fact of its distribution being primarily *parenchymatous,* that of the others being *meningeal, vascular,* or *interstitial.*

The clearer knowledge thus gained of the nature of general paralysis affords an explanation of its peculiar resistance to anti-syphilitic treatment: the pathogenic organisms are embedded in situations not reached by the medication.

There is still much in the etiology of general paralysis that is not well understood. The most important question demanding an answer is, Why do some syphilitics eventually develop general paralysis and others not? Probably not over 5% of syphilitics develop general paralysis.

In this connection one thinks, perhaps, first of all of a special predisposition. The view is often expressed that an inherited neuropathic constitution renders one more liable, on contracting syphilis, eventually to develop general paralysis, this view being based on the fact that in cases of general paralysis one finds rather frequently a family history of nervous or mental diseases, though not by any means so frequently as in the constitutional disorders. It is doubtful, however, if this view is really supported by the fact on which it has been based, as the latter is quite susceptible of a different interpretation, namely, that syphilis itself is more likely to be contracted by unrestrained, dissipated, and grossly immoral persons than by others, these traits being, in their turn, often among the manifestations of neuropathic constitutions. Thus, while a special susceptibility to the syphilitic virus may possibly have something to do with the development of general paralysis, the known facts do not seem to necessitate the assumption that the inherited neuropathic constitutions are especially related to this susceptibility.

Another view is that special strains of the syphilitic



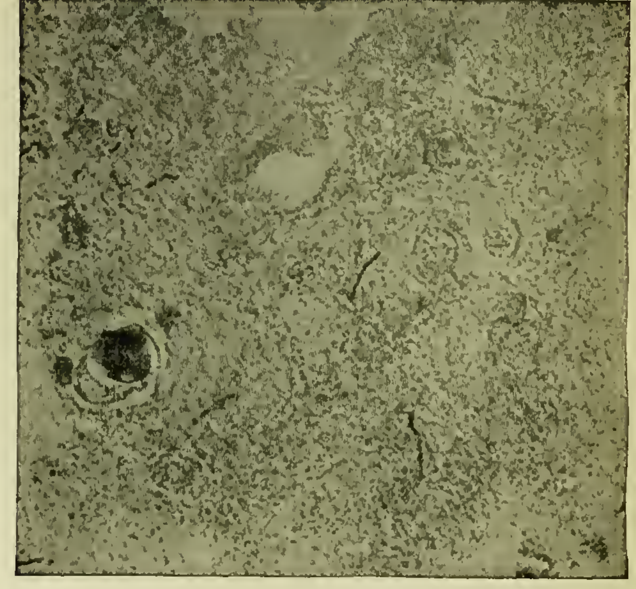


Fig. 2.—*Treponema pallidum* in the Brain of General Paralysis. (Noguchi and Moore.)

organism, more virulent toward nervous tissues, are responsible for the development of general paralysis and, perhaps, of other lesions of the nervous system, this view being based on the occasionally observed instances of conjugal paresis and of other instances of general paralysis occurring in two or more persons whose syphilitic infection can be traced to the same source. Such observations are, however, rare and, considering the great prevalence of syphilis, may be explained as coincidences.

That the distribution of an organism which is disseminated by the blood and lymphatic circulation and which is itself actively motile will vary in different cases according to mere chance would seem self evident; therefore it is not surprising that some cases of syphilis should have liver lesions, others bone lesions, still others lesions of the central nervous system, including general paralysis, etc., as their most prominent manifestations. Yet factors other than mere chance undoubtedly play a part in some cases. *Head injury*, for instance, has been shown by numerous carefully studied cases to be capable of starting general paralysis in a syphilitic person, acting, possibly, by opening a way for the migration of *treponemata* lodged in lymph spaces, interstitial tissues, or blood vessel walls into the brain parenchyma. *Alcoholism* has also been often mentioned as an exciting cause of general paralysis, but it is difficult to determine the exact part that is played by it in this connection.

It is a remarkable fact that in cases of tabes or of general paralysis the syphilis, during the years prior to the involvement of the central nervous system, runs a very mild course, often hardly furnishing evidence of its presence; secondary and, especially, tertiary manifestations (iritis, skin eruptions, gummata) are either slight or absent;[1] and at autopsies in cases of general paralysis one seldom finds the lesions ordinarily observed in old syphilitics, such as endarteritis, arteriosclerosis, valvular heart lesions, aneurisms,

[1] E. F. Snydacker. *Absence of Iritis and Choroiditis among Syphilitics who have become Tabetic.* Journ. Amer. Med. Assn., 1910.

infarctions, hepatic cirrhosis, etc. It would seem that in the cases destined to develop eventually tabes or general paralysis there is from the beginning a special distribution of the syphilitic infection. However this may be, the mildness of the manifestations usually leads to neglect of treatment, and that may certainly be said to increase the danger of tabes or general paralysis.

Among other factors in the etiology of general paralysis the most important are *sex*, *age*, *occupation*, and *environment*.

Syphilis being more common in men than in women, general paralysis, too, occurs more commonly in men. Thus, during the year ending June 30, 1918, there were 3530 male and 3267 female first admissions to the New York state hospitals; among them were 725 male and 188 female cases of general paralysis, i.e., 20.5% and 5.8% of all admissions, respectively.[1]

The great majority of cases of general paralysis occur between the ages of thirty and sixty. Thus of a total of 913 cases of general paralysis among the first admissions to the New York state hospitals in the year ending June 30, 1918, but 62, or 6.8%, developed before the age of thirty, and but 45, or 4.9%, at sixty or over.[1] Juvenile and even infantile cases are, however, sometimes met with, occurring generally on a basis of inherited syphilis.

All occupations do not equally predispose to syphilitic infection and, therefore, to general paralysis; unfortunately detailed and extensive statistics are not available. It is well known that army and navy officers, traveling salesmen, and railroad employees furnish a comparatively high proportion of cases of general paralysis, while the opposite is true of Catholic priests; Krafft-Ebing, for instance, saw among 2000 cases of general paralysis not one in a Catholic priest, while among his cases of insanity in army officers no less than 90% were cases of general paralysis.[2] Among

[1] Thirtieth Annual Report of the N. Y. State Hospital Commission, Albany, 1919.

[2] Quoted by Kraepelin. *Psychiatrie.* 8th Edition. Vol. II.

women professional prostitutes, naturally, furnish the highest proportion of cases of general paralysis.

Syphilis occurs much more frequently in urban than in rural environments; accordingly, urban communities furnish a greater proportion of cases of general paralysis. Thus, according to the United States Census, cities of 100,000 and over furnished 9.6 and rural communities but 1.6 cases of general paralysis per 100,000 of the general population among the admissions to hospitals for the insane in the year 1910.[1]

Prevention and Treatment.—The prevention of general paralysis consists mainly in measures for the prevention of syphilis, which have already been discussed in Part I, Chapter XII.

Early and thorough treatment of every case of syphilis has also already been mentioned as a measure for the prevention of syphilitic disorders of the central nervous system.

It is not wise to postpone treatment until a positive Wassermann reaction is obtained. The diagnosis should be made as early as possible in the primary period by demonstrating treponemata in the initial lesion with the microscope by the dark field illumination method.

Another point is to perform lumbar puncture, repeatedly if necessary, in the course of treatment of every case of syphilis, whether with or without evidences of involvement of the central nervous system. No case of syphilis should be discharged as cured until serological findings both in the blood and cerebro-spinal fluid have become permanently negative.

In some cases, in spite of active intravenous treatment, positive findings persist in the cerebro-spinal fluid. In such cases intraspinal treatment is indicated.

It is the consensus of opinion among syphilologists that patients, in whom permanently negative serological findings in the blood and cerebro-spinal fluid have been achieved by

[1] *Insane and Feeble-minded in Institutions.* 1910.

treatment, are no longer in danger of later development of tabes, general paralysis, or other forms of neuro-syphilis.

When general paralysis has developed treatment by anti-syphilitic remedies, at least as ordinarily administered in cases of syphilis, is of no avail, being apt even to do more harm than good. Recently attempts have been made to bring anti-syphilitic remedies more directly in contact with the seat of the lesion by administering them intraspinally or intracranially.[1] Somewhat encouraging results have been reported,[2] though it is still very doubtful if a permanent arrest of the process has been brought about in any case.

For the rest, the treatment is merely symptomatic. An institutional environment seems to have a beneficial influence in many cases, a calming down and general improvement being often observed soon after admission.

Excitement, insomnia, suicidal tendencies, and refusal of food are to be treated by the usual methods.

In the last stage great care must be taken to prevent the development of bed sores. This is a matter of proper nursing. The patient must be kept thoroughly clean and dry, especially when, owing to loss of sphincter control or to mental deterioration, he soils and wets himself several times a day. His position in bed must be changed frequently and

[1] Swift and Ellis. *The Direct Treatment of Syphilitic Diseases of the Central Nervous System.* N. Y. Med. Journ., July 13, 1912.—H. S. Ogilvie. *The Intraspinal Treatment of Syphilis of the Central Nervous System by Salvarsanized Serum of Standard Strength.* Journ. Amer. Med. Assn., Nov. 28, 1914.—D. M. Wardner. *A Report of Five Cases of Intracranial Injection of Auto-Sero-Salvarsan.* Amer. Journ. of Insanity, Jan., 1915.

[2] G. S. Amsden. *The Intraspinal Treatment of Paresis.* N. Y. State Hosp. Bulletin, Feb. 15, 1915.—H. A. Cotton. *The Treatment of Paresis and Tabes Dorsalis by Salvarsanized Serum.* Amer. Journ. of Insanity, July and Oct., 1915.—C. A. Neymann and N. H. Brush. *The Treatment of General Paresis.* Arch. of Int. Med., Aug., 1918.

systematically so as not to expose either one side or the other or the back to continuous pressure and friction; a pad may have to be placed between the knees or the ankles in cases with a tendency to contractures. The bed must be made carefully, avoiding unevenness, roughness, or wrinkles in the bed clothes. The skin over the parts that are exposed to pressure may be somewhat protected by sponging with alcohol, drying, and dusting with talcum powder. An air- or water-bed may be used, but will be found hardly necessary where the above-mentioned precautions are carefully observed. When bed sores develop they are to be treated by frequent and careful cleansing and protected by a simple dressing; the application of a saturated solution of picric acid seems often to promote healing.

Broncho-pneumonia is a common complication of general paralysis and is in the majority of cases the immediate cause of death. No doubt the general debilitating effect of the disease renders the patient more liable to develop this complication, and the chances are further increased in the last stage when difficulties of deglutition develop and food is apt to find its way into the respiratory passages. Yet here too, careful nursing can accomplish a good deal, and it is safe to say that the frequency of broncho-pneumonia can be considerably reduced. Demented patients will not complain of feeling cold, and it is the nurse's duty to have the patient at all times comfortably clad, well covered if in bed, and protected from draughts; special care must be observed when the patient has occasion to sit up in his bed, or leave his bed, and in bathing. Patients having to take their meals in bed should be placed in an easy, natural position, propped up with pillows, and not so as to have to reach over the side of the bed to get the food or to have to eat while partly reclining; when deglutition becomes difficult or uncertain they must not be allowed to feed themselves, but must be fed by a nurse or attendant slowly with finely divided food.

There is nothing ordinarily to be done for convulsions

beyond protecting the patient against injury. Continued convulsions are sometimes successfully combated by a high enema followed by the administration of 30 grains of potassium bromide and 20 grains of chloral hydrate per rectum, repeating the dose in an hour if necessary.

CHAPTER XV

SYPHILITIC DISORDERS (*Concluded*)

CEREBRAL ARTERIOSCLEROSIS [1]

Cerebral arteriosclerosis is not always of syphilitic origin, though probably much more frequently so than would be indicated by clinical statistics.

Disease of the arteries of the brain is often found at autopsies in cases which have shown during life no mental or nervous disturbances. The occurrence of such disturbances is probably determined by a certain extent or degree of arterial disease. Arteriosclerotic brain disease is but a part of general arteriosclerosis, though not infrequently the process is found to be much more marked in the brain than elsewhere.

The *symptoms* vary widely in different cases, depending chiefly upon the vessel or system of vessels affected.

Fig. 3 is a diagram of the arterial supply of the brain showing the circle of Willis, its branches and their distribution.

The terminal arterioles form two distinct systems: a system of short vessels supplying the cortex, and a system of long vessels which penetrate deeper and supply the marrow; the ganglionic vessels at the base constitute a

[1] Binswanger. Berlin. klin. Wochenschr., 1894.—Alzheimer. Allg. Zeitschr. f. Psychiatrie, 1902.—Gowers. *Manual of Diseases of the Nervous System*.—Lambert. N. Y. State Hosp. Bulletin, Vol. I; also in 20th Ann. Report N. Y. State Commission in Lunacy, pp. 91 *et seq.*

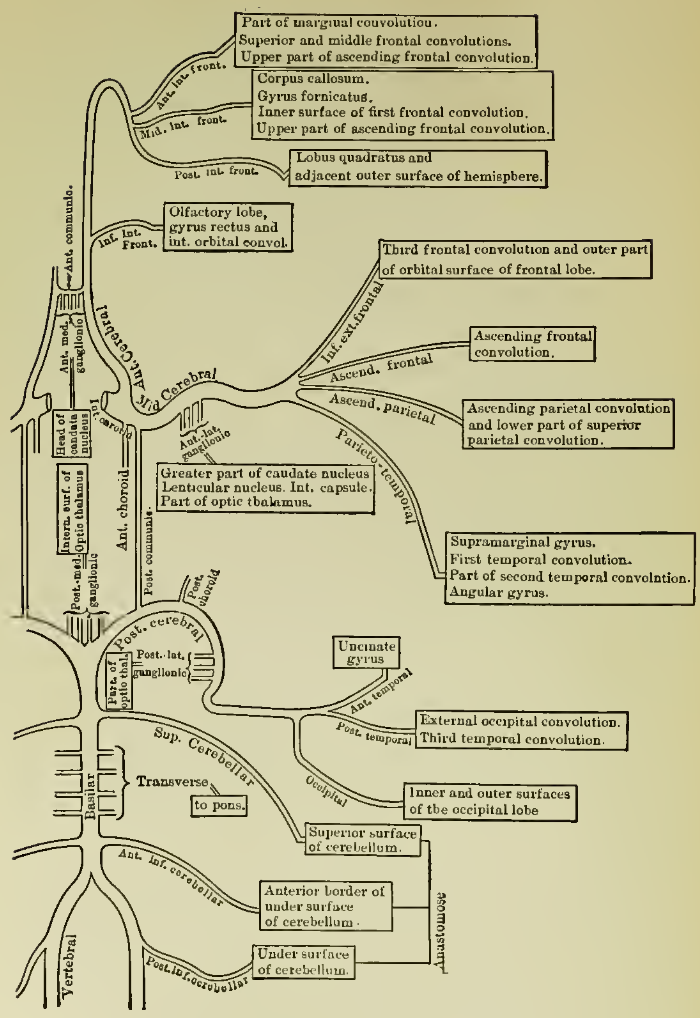


Fig. 3.—Arterial Supply of the Brain.

part of the medullary system. The manner of distribution of the terminal arterioles is shown in Fig. 4.

Arteriosclerotic disease may affect chiefly the large vessels given off from the circle of Willis or their principal branches; or it may affect chiefly the terminal arterioles, either the cortical or the medullary system, though the

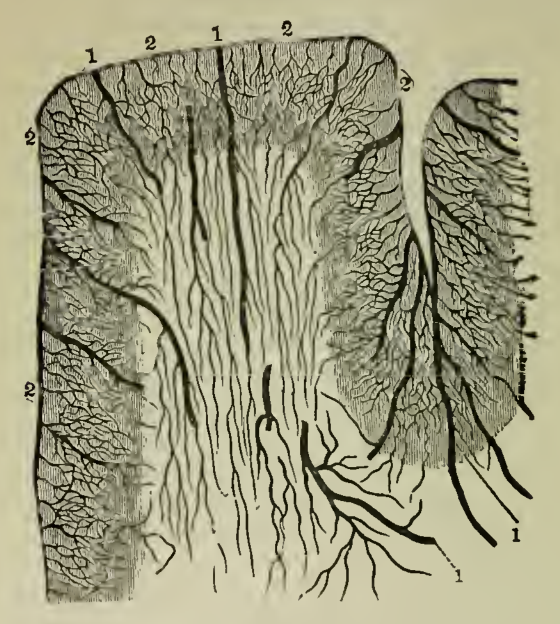


Fig. 4.—1. Long or Medullary Arteries. 2. Short or Cortical Arteries. (After Charcot, from Gray's Anatomy.)

process is hardly ever sharply limited to any one system of vessels.

The manner in which the nervous tissues are affected is variable. Narrowing of the lumen of a vessel resulting from obliterative endarteritis brings about atrophy of the nervous elements, due to reduction of the blood supply, there being at the same time hypertrophy of the neuroglia tissue (" perivascular gliosis " of Alzheimer); thickening of

the walls of the smallest arterioles and of the capillaries ("arterio-capillary fibrosis") results in atrophy through interference with osmotic processes; roughening of the intimal lining of the vessels results in the formation of thrombi or emboli with consequent infarction and softening; the brittle and weakened condition of the vessel walls and aneurismal dilatations combined with general rise of blood pressure result in rupture and hemorrhage with compression and destruction of nerve tissue to an extent depending upon the amount of extravasated blood.

The symptoms of arteriosclerotic brain disease may perhaps be most conveniently classified as follows: (1) systemic symptoms; (2) symptoms common to all forms of arteriosclerotic brain disease; (3) symptoms of occlusion of large vessels or their branches; (4) symptoms of affection of the medullary system of terminal arterioles; (5) symptoms of affection of the cortical system of terminal arterioles.

(1) *Systemic Symptoms.* These will not be dwelt upon in detail here, as they are more properly a subject of textbooks of general medicine. As being among the most important may be mentioned: rigid and tortuous peripheral arteries, increased blood pressure, pulse high in tension but small in volume, increased area of cardiac dullness, accentuation of the aortic sound, often evidences of chronic interstitial nephritis.

(2) *Symptoms Common to all Forms of Arteriosclerotic Brain Disease.* (*a*) *Physical symptoms:* headache, insomnia, muscular weakness, imperfect muscular control, attacks of faintness or dizziness, epileptiform or apoplectiform seizures. (*b*) *Mental symptoms:* diminished capacity for work, undue fatigability, emotional instability, states of depression or anxiety, drowsiness; later forgetfulness, disorientation, and general mental deterioration; a characteristic feature is the persistence of insight for a long time.

(3) *Symptoms of Occlusion of Large Vessels or Their Branches.* The symptoms usually come on suddenly in the form of a stroke, often, but by no means always, accom-

panied by loss of consciousness lasting from a few minutes to several hours or even longer; this may be followed by a dazed, confused, or delirious period from which the patient recovers with permanent symptoms the character of which depends upon the location and extent of the lesion.

(*a*) Occlusion of the *anterior cerebral artery* is uncommon; the symptoms depend upon the point of occlusion and upon whether the main vessel or one of its branches is occluded; there may be no special symptoms, or there may be loss of the sense of smell on one side or crural monoplegia.

(*b*) Occlusion of the *middle cerebral artery* or of its branches is very common; the characteristic symptoms for the four branches respectively are: (α) motor aphasia; (β) facial or brachial paralysis, or both; (γ) astereognosis; (δ) partial bilateral deafness, sensory aphasia, possibly lower quadrant hemianopsia. Lesions of the right hemisphere produce no aphasia in right-handed persons.

(*c*) Occlusion of the *posterior cerebral artery* has for its special symptom hemianopsia; this symptom, however, occurs only when either the main vessel or its occipital branch is affected.

(*d*) The *cerebellar arteries* communicate with each other by fairly free anastomosis; for that reason occlusion of one of them may cause but slight damage and give rise to no permanent symptoms; when the area of softening is extensive there are apt to be vomiting, vertigo, and muscular incoördination. In some cases the lesion involves parts of the pons and medulla, causing crossed hemianæsthesia, loss of the sense of taste, dysphagia, and aphonia, and rapidly leading to a fatal termination.

Occlusion of these vessels does not in itself as a rule cause marked general mental deterioration aside from that which is the characteristic accompaniment of states of aphasia.

(4) *Disease of the Medullary System of Terminal Arterioles* ("chronic subcortical encephalitis" of Binswanger) presents a characteristic picture at autopsy: the brain shows more or

less pronounced atrophy which is general but which is apt to be more marked in irregular foci; the surface of the brain is smooth, the cortex, though possibly somewhat thinned, is otherwise normal in gross appearance; the white substance and often the basal ganglia present on section slit-like defects where the nerve substance has disappeared either by gradual atrophy or through sudden infarction; these defects may be so numerous that the brain substance, riddled with them, presents a spongy appearance which has been called *état criblé*; in other cases there may be but one or two of them in each hemisphere. The distribution of the affection is variable; usually it is bilateral; in some cases, however, it may involve largely one hemisphere, the other being almost entirely spared; in other cases the ganglionic vessels are the principal seat of the affection.

The more striking clinical features of this type of cerebral arteriosclerosis are recurrent epileptiform or apoplectiform seizures and paralyses, anæsthesias, and mental deterioration the course of which is irregularly progressive, increasing with each seizure and remaining stationary or even receding somewhat in the intervals; toward the last the patients become helpless owing to paralyses, contractures, and profound dementia.

In cases in which the affection is largely confined to the ganglionic vessels the dementia is but slight. In such cases there is a special tendency toward the formation of small aneurisms which frequently burst, and the resulting hemorrhage into the basal nuclei, the internal capsule, and the lateral ventricle gives rise to the familiar clinical picture of cerebral apoplexy followed by hemiplegia, dysarthria, etc.

(5) *Disease of the Cortical System of Terminal Arterioles* also presents a characteristic anatomical picture. The surface of the cortex instead of being smooth is irregularly pitted with small depressions which mark the sites of atrophy and contraction in the regions supplied by the cortical arterioles the lumina of which have become narrowed or completely obstructed. The lesion is as a rule unequally dis-

tributed but rather extensive, so that there is marked general brain atrophy. Microscopically one finds various stages of chronic nerve cell change: pigmentary degeneration shrinkage, atrophy; the nervous elements in the affected areas ultimately disappear and are replaced by glia tissue.

Clinically the special feature here consists in various irritative phenomena followed later by loss of function: tremors, athetoid or choreiform movements, various seizures, paræsthesias, and later paralyses and anæsthesias. The mental symptoms are apt to be prominent from the beginning: hallucinations, agitation, violent excitement, confusion, inaccessibility.

Diagnosis.— General paralysis may be closely simulated but can always be excluded with the aid of lumbar puncture which in cerebral arteriosclerosis regularly gives negative results.

Acute syphilitic endarteritis affecting the brain arteries may be clinically indistinguishable from cerebral arteriosclerosis. The differentiation may be made with the aid of the Wassermann reaction. Cases of arteriosclerotic brain disease, even when due to old syphilitic infection, usually give a negative reaction, for in such cases as a rule the syphilitic process is no longer active, the lesions being post-syphilitic.

The differentiation from senile dementia may be difficult especially when the latter is complicated by more or less marked arteriosclerosis, as is so often the case. It must be borne in mind that senile dementia has for its basis a process of atrophy which is wholly independent of vascular disease. Focal symptoms, recurrent seizures, persisting mental insight, also stationary condition and duration over five years, all point to cerebral arteriosclerosis. Senile dementia is but exceptional before the age of sixty years, while cerebral arteriosclerosis often begins at fifty or even earlier.

The *course* of cerebral arteriosclerosis in most cases extends over a number of years, even ten or twenty years. It is irregularly progressive, as already described. In any

case sudden death may occur from embolism, apoplexy, or from exhaustion following convulsions. Kraepelin speaks of a grave progressive form which is characterized by rapid development of extreme dementia and an early fatal termination.

The *prognosis* of all forms of arteriosclerotic brain disease is unfavorable for recovery from established defect symptoms; sudden or gradual progress of the disease is to be expected to occur sooner or later, though the condition may remain approximately stationary for months or even years, expecially under favorable conditions.

The *treatment* is purely symptomatic. Rest, freedom from worry or excitement, moderation in eating and drinking, abstinence from alcohol, proper regulation of the bowels may stave off progress of the disease or the occurrence of seizures.

CHAPTER XVI

TRAUMATIC DISORDERS

Traumatisms may play a part in the etiology of psychoses essentially of a constitutional nature, and they have been known to cause the development of general paralysis in syphilitic persons; it is believed also that they can precipitate an attack of delirium tremens in an alcoholic person. Such cases are not included here under the designation of traumatic psychoses, but only those in which the traumatism constitutes the essential, if not the sole, cause of the mental disorder.

As already stated in the chapter on Etiology, traumatic psychoses are comparatively rare in psychiatric practice: but 0.44% of all male first admissions and 0.06% of all female first admissions to the New York state hospitals during the year ending June 30, 1917, were cases of traumatic psychoses.

The immediate results of head injuries come more frequently under the observation of surgeons than psychiatrists.

The nature of the injury in cases of traumatic psychoses is variable: fractures with depression of fragments and destruction of brain tissue by direct violence; compression or brain tissue destruction resulting not directly from the injury but indirectly from an intra-cranial hemorrhage following it; severe concussion in cases with linear fracture without encroachments on the cranial cavity or even in cases without fracture; bullet wounds, etc. Complicating infections naturally bring with them febrile or infectious deliria the manifestations of which it is difficult, if not impos-

sible, to separate from the symptoms directly attributable to the injury.

Many cases of head injury undoubtedly occur without any considerable injury to the brain, and this in part accounts for the rarity of marked and lasting mental complications; yet it is also true that fairly extensive injury to the brain may occur without giving rise to such complications. It would seem that mental symptoms are determined by the diffuse effects of concussion, compression, or bruising, rather than by any special localization of circumscribed lesions.

The first effect of a head injury is a dazed, stunned, or completely unconscious condition which comes on either immediately or, where due to an intra-cranial hemorrhage, after an interval following the injury. This lasts from a few minutes to several hours, after which consciousness may be fully regained or the patient may remain somnolent for several days and then recover. Cases of very severe injury often terminate in death without return of consciousness.

Traumatic Delirium.—Delirium following head injuries is observed either immediately after the initial coma or stupor or after a brief interval of comparative lucidity. It is characterized by restlessness, which may be slight and readily controllable or may become aggressively violent, disorientation, disconnectedness of utterances, more or less relevant but peculiarly absurd and irrational responses, and tendency to fabrication; psycho-sensory disturbances may occur but do not seem to be as prominent as in other deliria.

The possible terminations are death, complete recovery, and recovery with mental or physical residuals. The duration of cases which survive usually extends over several weeks, and in some cases convalescence lasts for weeks or even months after the acute period of the illness. In the *treatment* the advisability of early surgical interference should always be considered; not only may an immediate amelioration be often produced by raising depressed parts of bone, removing intra-cranial blood extravasations, etc.,

but also some of the possible sequelæ may be prevented. The danger of craniotomy is now so slight that its performance in doubtful cases would seem justifiable even merely for exploration.

The following case is quite typical:

Adrien D., mason, aged thirty-five, without abnormal family or personal antecedents, fell from a scaffolding about five meters high upon unpaved but dry and hard ground. He was picked up unconscious and taken to his home.

Externally was found only a small contused wound at the top of the head, without lesion of the bone, which healed in a few days.

After being in coma eighteen hours the patient gradually regained consciousness, but for eight days remained in a state of marked confusion. He is stupid, dull, completely disoriented as to place and time, and dreams a good deal, especially at night. He reacts to physical stimulation (pricking, pinching), but does so slowly and feebly. He does not respond to questions unless they are very simple.—He has become oriented as to place but is still completely disoriented as to time. His attention is difficult to gain and impossible to hold. Recollection of occurrences preceding the accident is labored and inaccurate. He has complete amnesia for the accident and what followed. Actual impressions are fixed in his mind for but a very short time: at the end of five minutes he forgot that he had been visited by the physician. He often brings his hand up to his head without saying anything, and when asked if it hurts him says, "Yes, a little." In the day time some illusions are noted, the patient mistaking persons for one another. Sleep is scarce, and the greater part of the night is passed in a dream state, chiefly occupational: he thinks it is time to go to his work, asks for his clothes, gets up and looks for his tools, converses with imaginary persons, complains that the cords have not been properly placed, that the mortar is too thick, etc.

After the first week attention and memory improved a little. The patient retains some few impressions; yet the amnesia of fixation, though no longer complete, as in the preceding period, is still very marked. The disorientation of time persists. A most active and mobile tendency to confabulation has appeared. One month after the accident, when the patient had not yet left his bed, he told of having been eight days before at the fair in X., where his brother-in-law, a cattle dealer, had gone to sell some oxen. In response to leading questions he gives minute details, which vary from one moment to the next and become contradictory. When the contradictions are pointed out to him he admits readily that he may have been mistaken as his memory had failed him. The realiza-

tion of his abnormal state is, however, but transitory and weak. When told that he is sick and must take care of himself he shows an irritability not previously noted, falls into violent anger, refuses medicine which is offered him, saying he has had enough and wants to go.

He has a vague idea that he has been in an accident, but, altbougb it has been spoken of many times in his presence, cannot tell the exact circumstances of it. Until the sixth week he knew only tbat be had fallen, but from where, what height, how, he did not know: perhaps from a roof, or a ladder, or a scaffold—such things, he said, happened often in his trade. Sometimes, by way of confabulation, be becomes more specific. Thus about five weeks after the accident he told how he had fallen from a carriage while be and his master were on their way to see what work there was to be done. Anotber day he told that a heavy brick had fallen on his head. (In fact he had had a brick fall on his head about two years previously, but from a very low height and without causing any appreciable harm.)

He inquires from time to time if his insurance has been paid, but does not occupy himself effectually with the defence of his rights and does not seem to be interested in the progress of the negotiations concerning this matter.

Physically there is to be noted, aside from the headache mentioned above, only a general muscular weakness and some vertigo. No signs of any localized cerebral lesion. No convulsive manifestations.

The patient's condition remained almost stationary for about three months. After that, gradually, attention improved, memory was restored, the pseudo-reminiscences became more rare and were spontaneously corrected. Finally at the end of six months he could be considered convalescent, there remaining but occasional vertigo, a certain mental and physical fatigability, and an amnesic gap commencing very sharply a few instants before the accident and ending imperceptibly somewhere in the course of the second month by giving place to some fragmentary and vague recollections whicb grew gradually more complete and more precise.

Traumatic Constitution.—This is the commonest of the above mentioned mental residuals which may persist after recovery from traumatic delirium; it is also frequently found in cases in which no delirium at all has developed after the initial coma or stupor. The condition has been well described by Köppen[1] as one of irritability, forgetful-

[1] Arch. f. Psychiatric, Vol. XXXIII. Quoted by Adolf Meyer. *The Anatomical Facts and Clinical Varieties of Traumatic Insanity.* Amer. Journ. of Insanity, Jan., 1904.

ness, diminished working capacity, inability to concentrate attention, and increased susceptibility to alcohol. "The formerly good-natured or even-tempered persons become irascible, hard to get along with; formerly conscientious fathers cease to care for their family." The forgetfulness may be so marked that "frequently everything must be written down." "These patients are unable to concentrate their attention even in occupations which serve for mere entertainment, such as reading and playing cards. They like best to brood unoccupied; even conversation is rather obnoxious. This point is so characteristic that it gives a certain means of distinction from simulation, which as a rule does not interfere with taking part in the conversations and pleasures of the ward and playing at cards which means as a rule too much of an effort for the brain of actual sufferers." Physically there are apt to be pain or feeling of pressure in the head and a tendency toward dizziness. "Excessive sensitiveness of their head obliges them to avoid all work which is connected with sudden jerks; bending over is especially troublesome; and there is hardly any physical work in which this can be avoided; the blood rushes to the head, headache increases, dizziness sets in, and the work stops. Patients feel best when in the open air, inactive, and undisturbed."

Traumatic Epilepsy.—In many cases ordinary epilepsy is wrongly attributed to an obviously inadequate traumatism. However, the existence of true traumatic epilepsy is hardly to be questioned. The seizures may be slight, or partial, or Jacksonian, or without complete loss of consciousness, or, on the contrary, exactly like those of idiopathic epilepsy; the intervals at which they occur are variable; they may come on spontaneously or only following physical exertion, indulgence in alcohol, or febrile or gastro-intestinal ailments. The mental condition is apt to be much like the above described traumatic constitution with the addition of confused or delirioid states occurring in connection with seizures; in cases with frequent seizures there is apt to be a

slowly progressive deterioration like that of idiopathic epilepsy.

Traumatic Dementia.—This consists mainly in an exaggeration of the memory and attention defects, general incapacitation, and loss of interests characterizing the above described traumatic constitution.

Aphasia, deafness, paralysis, and other neurological symptoms, depending on the localization of the brain injury, may, of course, also be observed.

CHAPTER XVII

MISCELLANEOUS GROUPS

DELIRIA OF INFECTIOUS ORIGIN [1]

The mental disorders which appear in the course of infectious diseases are brought about by the combined action of several factors: elevation of temperature, congestion of the nervous centers, and poisoning of these centers by microbic toxins. The most important factor appears to be the poisoning of the nervous centers.

One cannot fail to notice the striking clinical resemblance existing between toxic deliria and infectious deliria; indeed the resemblance is so close that without the somatic symptoms peculiar to each condition it would be difficult or even impossible to make the differentiation. Notes on such cases almost always describe the same symptoms: clouding of consciousness, confusion, numerous illusions and hallucinations, motor agitation.

Moreover, the infection itself, independently of hyperpyrexia and probably of any meningeal lesion, may cause grave mental disorders (infectious delirium proper) which can only be explained by a toxic action.

Febrile Delirium.—In the mental disorders of febrile origin three degrees of intensity can be schematically distinguished.

In the slightest degree of intensity the disorder is limited to slight *mental torpor* and *irritability*.

In the second degree there is *disturbance of ideation.*

[1] Klippel et Lopez. *Du rêve et du délire qui lui fait suite dans les infections aiguës.* Rev. de Psychiatrie, April, 1900.—Desvaux. *Délire dans les maladies aiguës.* Thèse de Paris, 1899.

The remarks of the patient become disconnected, and are characterized by a peculiar monotony suggestive of a fixed idea. Ten times in succession he will ask whether the cupboard is properly locked, or whether such and such a matter has been attended to, or whether some particular note has been duly paid. At the same time some illusions, chiefly affecting vision, make their appearance. It seems to the patient that someone is hiding behind the curtains, that the furniture in the room has assumed peculiar shapes. He does not recognize the voices of those about him and confounds them with one another. All these phenomena the patient is more or less conscious of. He realizes, either spontaneously or from the remarks made by those about him, that he is mistaken, "that he is raving, that he no longer knows what he is talking about." He is in a state of indefinable uneasiness and is apt to become somewhat restless, especially at night. He feels ill at ease in his bed, tosses from side to side, asks to get up.

Finally, in the third degree of intensity we have true delirium. This consists essentially in *more or less profound clouding of consciousness combined with vague delusions, multiple psycho-sensory disorders, and motor excitement which is at times very marked.*

The delirium is essentially variable and mobile, at time pleasant, at others painful; the psyeho-sensory disturbances are of the combined form with a predominance of illusions and hallucinations of sight. Images and scenes follow one another as in a dream, of which they seem to be a continuation (dream delirium). The patient imagines he is in the country, in a theater, in a church; pompous processions march past him amidst the sounds of music and the perfume of flowers and censers; he converses with imaginary persons, defends himself against assassins, rejects a glass of milk offered him, thinking that it is poison. Often under the influence of his hallucinations he strikes at the air and attempts to get out into the street or to pass through the window, which he takes for the door.

However, as during a dream, the subject may by a sudden and energetic call be transported from his imaginary world into the real one. Such periods of lucidity are in general but transitory.

Often, chiefly in the beginning of all forms and through the entire course of the mild forms, the delirium disappears in the morning to reappear in the evening and to last during a portion of the night.

The *prognosis* depends less upon the intensity of the delirium than upon the physical symptoms which accompany it. As a rule all febrile affections complicated by intense delirium should be considered grave.

In fatal cases the delirium gradually subsides and coma replaces the excitement.

Febrile delirium, like acute alcoholic intoxication, is an excellent criterion for judging the resistance of the psychic organization: the greater the predisposition to mental disorders the more likely it is for delirium to occur under such circumstances. Like alcohol, microbic poisons and toxic products of the organism affect most readily minds the equilibrium of which is least stable and therefore most easily disturbed.

The *treatment* is that of the infectious disease. Strict watching is indicated. Cold baths are often very efficacious in relieving the mental disorders.

Infectious Delirium Proper.—Kraepelin and Aschaffenburg have described under the name of *infectious delirium* mental disorders which supervene in the course of an infection without the fever being particularly intense or even before any fever has appeared (*Initial delirium*).

Infectious delirium is met with chiefly in typhoid fever, in variola, and in typhus fever. The symptoms sometimes take the form of maniacal excitement, more often that of an acute confusional state or of hallucinatory delirium.

CHAPTER XVIII

MISCELLANEOUS GROUPS (*Continued*)

PSYCHOSES OF EXHAUSTION: PRIMARY MENTAL CONFUSION, ACUTE DELIRIUM

WELL described by Georget and by Delasiauve, primary mental confusion has only recently been brought again into prominence in French medical literature through the labors of Chaslin and of Séglas.[1]

The fundamental element of this morbid entity is mental confusion which is *primary, profound, and constant.*

Essential Symptoms.—After several days of ill-defined prodromata such as headache, anorexia, and change of disposition, the disease sets in, manifesting itself by psychic and physical symptoms.

A. Psychic Symptoms.—These are the symptoms of intellectual confusion, more or less marked and more or less pure according to the gravity of the disease:

Clouding of consciousness;

Impairment of attention;

Sluggish and disordered association of ideas;

Insufficiency of perception;

Aboulia, characterized by constant indecision and by slowness and uncertainty of the movements.

The state of the automatic psychic functions varies according to the form of the disease: mental automatism may be relatively unaffected (simple mental confusion), exaggerated (delirious mental confusion), or paralyzed, like

[1] Chaslin. *La confusion mentale primitive.*—Séglas. *Leçons cliniques.*

the higher mental functions (mental confusion of the stuporous form).

B. Physical Symptoms.—The physical symptoms are constant and "are the expression of the *general prostration, exhaustion,* and *malnutrition*" (Séglas).

Loss of flesh is an early and a very marked symptom. It is caused by insufficient alimentation, digestive disorders, and defective assimilation.

Fever sometimes exists, chiefly at the onset; in some cases, especially in the stuporous form, there may be *subnormal* temperature.

A small low tension *pulse,* feeble and at times irregular heart sounds, sluggishness of the *peripheral circulation,* cyanosis of the extremities, and œdema are among the manifestations of the general atony of the cardiovascular apparatus.

Appetite is lost, the tongue coated; the process of digestion is accompanied by painful sensations; constipation is often present and is very obstinate.

Frequently there is slight albuminuria. The *toxicity of the urine* is often increased, this being dependent on the presence of certain ptomaines in the urine (Ballet and Séglas).[1]

Sleep is diminished, often replaced by a dreamy state analogous to that of the infectious diseases.

Primary mental confusion may be met with in four principal forms, differing in their gravity and in the predominance of one or another class of symptoms:

Simple mental confusion;

Delirious mental confusion;

Stuporous mental confusion;

Hyperacute mental confusion (acute delirium).

Simple Form.—The essential symptoms which have been enumerated above are encountered here in their

[1] For a bibliography bearing on the changes in the urine in mental confusion and in the psychoses in general, see Ballet. *Les psychoses.* (Article in *Traité de Médecine,* edited by Charcot, Bouchard and Brissaud.) Chapters on Melancholia and Mental Confusion.

purest form. The phenomena of psychic paralysis are of a moderate degree ot intensity and the automatic mental functions are unaffected.

The patient is often more or less conscious of his condition; he observes that a change has taken place in him. "I am losing my head. . . . My mind is a blank. . . ." He perceives his mental disability and complains of being unable to gather or direct his thoughts or to evoke reminiscences—even of events that have left a very strong impression.

The indecision and insufficiency of perception bring about a state of *constant bewilderment.* The patient keeps repeating the same questions and the same exclamations: "Who is there? . . . Who has come? . . . Who are you? . . . Everything around me has changed." He does not recognize his surroundings, or if he does, it is with uncertainty. He is not sure of the identity of those about him; his bed appears queer, his own body seems to be changed, scarcely recognizable. It seems that his personality is going to pieces so that he no longer recognizes himself. The notion of time is impaired. The patient cannot tell whether he has been at the hospital a day or a week. In other words the patient's orientation suffers in all its elements: allopsychic, autopsychic, and temporal. The disorientation is generally more marked when the patient is away from his habitual surroundings. While surrounded by familiar persons and objects, the patient orients himself more or less automatically, in a new place he could find his bearings only by a series of mental operations of which he is no longer capable.

The reactions are slow, undecided; the movements awkward and clumsy.

The mental automatism remaining intact, those mental operations which require no effort and no intervention of the will can still be properly performed. Thus one may obtain from the patient a certain number of relevant and accurate replies to questions concerning his age, occupation, residence,

etc. But these replies are always given mechanically; they are brief and abrupt, and can be elicited only by putting the questions energetically and concisely.

This simple, and, so to speak, schematic form of primary mental confusion is uncommon.

Delirious Form.—This form, much more frequent than the preceding one, owes its peculiar aspect to a more or less marked exaggeration of the activity of the mental automatism, which gives rise to: (*a*) flight of ideas and incoherence; (*b*) delusions and psycho-sensory disorders; (*c*) more or less motor excitement.

The *delusions* present no systematization, as for this at least a relative lucidity is necessary. They assume different forms, which often change; ideas of grandeur, transformation of personality, melancholy ideas, ideas of persecution. Painful delusions are the most common. Sometimes the ideas are absurd, like those of senile dements or of general paralytics.

The *psycho-sensory disorders* consist sometimes in agreeable, but more often in painful, illusions and hallucinations of all the senses, though most often of vision and of hearing. They may combine so as to create an imaginary world which is mobile and changeable, or, on the contrary, they may exist together without any apparent correlation.

Occasionally the incessant illusions and hallucinations impart to the patient a peculiar expression. Most cases described under the name of hallucinatory delirium should properly be included in this form of mental confusion.

The *emotional tone* is variable, governed to some extent by the *delusions*. However, one often finds, in spite of very active delirium, a striking indifference, so that a certain discord exists between the delusions and the emotions.

The *motor excitement* is not always due to delusions or psycho-sensory disturbances. As in dementia præcox, so also in this condition the patient may give vent to cries and motor discharges that are purely automatic and without any apparent purpose.

Stuporous Form.—Here the psychic paralysis involves not only the higher mental faculties, but also the automatic functions.

The limbs are motionless, the eyes dull, and the face expressionless; the mouth may be half open and the saliva dribbling away uncontrolled. The patient fails to react even to the strongest stimulation, or he may react but very feebly.

Cataleptic attitudes with dilated pupils are frequently seen.

Hyperacute Form (Acute Delirium).—This form is characterized by special intensity of the delirium and motor excitement, and by great gravity of the general symptoms.

The patient, assailed by numerous hallucinations, either painful, or agreeable and accompanied by erotic tendencies, becomes completely disoriented and wildly excited: he shouts, sings, jumps out of bed, strikes the walls, and attacks those about him. The eyes are injected, respiration is panting, skin covered with perspiration, temperature high, and the pulse small and often rapid and irregular. These signs point to the general gravity of the condition. In fatal cases the patient rapidly passes into coma and dies in a few days. In favorable cases the agitation gradually disappears, the patient regains his sleep, and recovery finally takes place; this favorable termination is rare.

Duration, Course, and Prognosis of Primary Mental Confusion.—The duration of the attack varies from several days to a few months. The curve representing its intensity is rapidly ascendant, then it remains stationary for some time with some oscillations, and finally descends gradually. The period of descent often presents irregularities on account of recrudescences of the disease, which are usually mild.

Such is the course of favorable cases, which fortunately are the most frequent (excluding acute delirium). *Recovery* is complete. But the patient's recollection of the events which have taken place during his illness is vague or even absent. The period of *convalescence* is protracted.

Suicide is rare even in the depressed forms; the aboulia is the patient's safeguard.

In unfavorable cases death occurs from collapse in the hyperacute form, and from cachexia or from some complication (pneumonia, subacute tuberculosis, influenza, infections following traumatisms) in the less rapid cases.

Diagnosis.—The principal elements of diagnosis are: appearance of mental confusion at the onset; possibility of obtaining correct replies to simple and energetically put questions; state of physical exhaustion, and existence of the special etiological factors, which we shall mention farther on.

Pathological Anatomy.—The lesions of primary mental confusion are of two kinds: inflammatory and degenerative. The former, which are most prominent in the severe cases, consist in congestion and diapedesis in the nervous centers. The latter are more constant, and consist in degeneration of the nerve-cells, which is demonstrable by Nissl's method.[1]

Etiology.—All factors capable of bringing about rapid and profound exhaustion of the organism occur in the etiology of primary mental confusion: physical and mental stress, painful and prolonged emotions, but especially *grave somatic affections*. The puerperal state, through the exhaustion which it entails as well as through the nutritive disorders and infections by which it is sometimes complicated; the infectious diseases (typhoid fever, the eruptive fevers, influenza, cholera); profuse hemorrhages; inanition, etc., are among the causes frequently found in the history of the disease.

How is the action of these factors to be explained? Two hypotheses are possible.

According to one, that of Binswanger, the general exhaustion of the organism brings about *deficient cerebral*

[1] Ballet et Faure. *Contribution à l'anatomie pathologique de la psychose polynévritique et certaines formes de confusion mentale primitive.* Presse méd., Nov., 30, 1898.—Maurice Faure. *Sur les lésions cellulaires corticales observées dans six cas de troubles mentaux toxi-infectieux.* Rev. neurol., Dec., 1899.

nutrition the clinical expression of which is primary mental confusion.

According to the other, advanced by Kraepelin, the causes enumerated above bring about disturbances in the nutritive changes and determine the production of toxic substances which, acting upon the cerebral cells, give rise to an *intoxication psychosis*: primary mental confusion.

Perhaps both causes are at work simultaneously. In either case exhaustion constitutes the essential cause of the affection and the term "*Exhaustion Psychosis*" is therefore perfectly applicable to it.

Treatment.—During the entire acute period of the disease *rest in bed* should be rigorously enforced.

Proper *alimentation* is of great importance. A reconstructive diet better than all medication sustains the patient's strength and even calms the agitation. Milk, eggs, chopped meat, and meat-juice should form the basis of the diet.

In cases of refusal of food one must resort without hesitation to artificial feeding; these patients cannot with impunity be allowed to fast. Gastric lavage sometimes gives good results, even in cases of acute delirium.

Injections of saline solution are of great service and easy of application. The necessary apparatus consists chiefly of a glass funnel, a soft-rubber tube, and a slender trochar.

Ordinarily 300–500 grams of normal saline solution may be injected every day or every second day.

The most important results of this treatment are elevation of blood pressure and diuresis.[1]

Moderate physical exercise, life in the open air, reading, and light mental work for brief periods at a time accelerate the course of convalescence.

[1] Cullerre. *De la transfusion séreuse sous-cutanée dans les psychoses aiguës avec auto-intoxication.* Presse méd., Sept. 30, 1899.—Jacquin. *Du sérum artificiel en Psychiatrie.* Ann. méd. psych., May–June, 1900.

CHAPTER XIX

MISCELLANEOUS GROUPS (*Continued*)

PSYCHOSES OF AUTOINTOXICATION: URÆMIC DELIRIUM

Uræmic delirium presents the usual features of toxic deliria: more or less complete clouding of consciousness, disorientation, phenomena of psychic automatism, among which psycho-sensory disorders occupy a prominent position.

The delusions, the emotional tone, and the reactions enable us to distinguish two principal forms of uræmic delirium: an expansive form and a depressed form.

Expansive Form.—The patient is a great personage, a general, a prince; he assists at a grand review, gives commands to his officers, or orders sixteen horses to be harnessed to his carriage; the Pope presents him with the imperial crown.

Often the delirium takes a *mystic* form: the heavens open, celestial music is heard, or angels descend on an immense ladder as in Jacob's dream.

Depressed Form.—Melancholy ideas combine with ideas of persecution and hallucinations of an unpleasant character. The patient imagines people are searching for him to drag him to the scaffold; the house is on fire; an odor of sulphur is diffused through the air.

Whatever the form of delirium, the reactions often rise to violent, at times terrible, agitation. Often, also, in the depressed and mystic forms, there is marked stupor with a tendency to cataleptoid attitudes.[1]

[1] Brissaud. *De la catatonie brightique.* Sem. méd., 1893.—Cullerre. *Sur un cas de folie urémique consécutif à un rétrécissement traumatique de l'urèthre.* Arch. de neurol., Vol. XXVII, No. 89.

As to the development of the attack, we distinguish an *acute form* characterized by severe symptoms: intense agitation or, on the contrary, profound stupor, incessant hallucinations, extreme confusion with clouding of consciousness, etc.; and a *subacute form* characterized by symptoms of lesser intensity and by periods of comparative lucidity alternating with delirious periods.

In some exceptional cases of subacute form the delusions become systematized and may thus be misleading in the diagnosis.

The mental symptoms of uræmic delirium present no pathognomonic features and are merely a manifestation of poisoning of the cerebral cells. The *diagnosis* must be made from the accompanying somatic symptoms: convulsive attacks, cardiovascular disorders, dyspnœa, œdema, pupillary manifestations—myosis and paresis of the pupils—diminution of the specific gravity and of the toxicity of the urine, albuminuria, anuria, oliguria, or polyuria.

Uræmic delirium is often very similar to delirium tremens. It seems that the two affections may even be combined. Brault [1] is of the opinion that uræmia, like traumatism or pneumonia, may act as the exciting cause of an attack of delirium tremens. We have already seen how much importance is attributed by some authors, notably Herz, to uræmia as a pathogenic factor in delirium tremens.

The *prognosis* depends upon the severity of the somatic disturbances.

The *treatment* is that of uræmia in general: milk dict blood-letting, purgatives, and diaphoretics.

[1] *Traité de médecine.* Charcot-Bouchard. *Maladies des reins.*

CHAPTER XX

MISCELLANEOUS GROUPS (*Continued*)

THYROGENIC PSYCHOSES

HYPOTHYROIDISM: MYXŒDEMA; CRETINISM.—HYPERTHYROIDISM: EXOPHTHALMIC GOITER

DESTRUCTION of the thyroid gland gives rise to peculiar autointoxication which is met with in two clinical forms: *myxœdema* and *cretinism:* in the former the destruction of the gland occurs at an adult age, in the latter it occurs in infancy.

§ 1. MYXŒDEMA

The external aspect of a myxœdematous patient is characteristic. The puffed and expressionless face together with the general attitude reflect both mental inertia and profound disorder of general nutrition.

Psychic Disturbances.—These consist chiefly in symptoms indicating a *blunting and torpor of cerebral activity* —psychic paralysis; there is extreme sluggishness of association of ideas demonstrable by simple clinical examination as well as by psychometry; the attention is difficult to obtain and to fix; there are also retrograde amnesia by default of reproduction and anterograde amnesia by default of fixation; permanent indifference; aboulia.

The indifference is occasionally interrupted by transient attacks of irritability. Myxœdematous patients are often sulky and ill-natured.

Physical Disturbances.—Sleep is diminished, replaced by permanent somnolence, and disturbed by nightmares.

The reflexes are diminished or abolished; all movements are sluggish and clumsy.

But the most striking changes are those of the *integuments* and of the *thyroid gland.*

Integuments.—The skin is thickened and infiltrated; its surface is smooth and of a dull whiteness. On palpation it gives the sensation of waxy tissue. There is no pitting on pressure, this being a point of distinction between myxœdematous infiltration and anasarca.

The features are dull, eyes sunken, lips thickened; the wrinkles of the forehead disappear, and the naso-labial folds become effaced. The physiognomy is immovable and stupid. The hair of the head, eyebrows, and beard is scant, discolored, and atrophied. These characteristics are pathognomonic of the myxœdematous facies.

The hair over the entire body is atrophied. The nails become deformed and brittle.

The mucous membranes present thickening analogous to that of the skin. They are pale, anæmic, and in places cyanotic.

Thyroid Gland.—On palpation one finds atrophy or even complete absence of the gland.

Sometimes the thyroid gland is increased in size, causing an abnormal prominence in front of the neck. This hypertrophy, true or false, is generally transitory, and occurs chiefly in the early stages of the disease. When the swelling persists through the entire duration of the affection, it is usually the result of cystic degeneration of the gland.

The visceral disorders are not characteristic; they indicate general atony and diminished vitality of the organism: small, compressible pulse, sluggish and painful digestion, and constipation.

The **course** of myxœdema is progressive, but interrupted by frequent remissions.

If no appropriate treatment is instituted, the stock of ideas becomes diminished, psychic inertia becomes extreme and complete dementia is established; also the physical symp-

toms become accentuated and death supervenes either from cachexia or from some complication (pulmonary tuberculosis).

Treatment.—It is possible to supply, to a certain extent, the deficiency caused by atrophy of the thyroid gland by the administration of the thyroid substance of animals (almost exclusively that of the sheep), either in the crude form or in the form of pharmaceutical preparations. The thyroid substance may be administered in tablets, pills, or capsules containing it either in the fresh state or dried and reduced to a powder.

A glycerine extract of thyroid gland is also prepared and is known by the name of thyroidine.

Finally, Baumann and Proos have extracted from the sheep's thyroid a substance, *iodothyrine*, which seems to be the active principle. This substance is "triturated with sugar of milk in such proportions that 1 gram of the mixture represents 1 gram of the fresh gland." [1]

Thyroid medication must be employed with great caution. Toxic symptoms are easily produced: acceleration of the pulse and respiration, headache, attacks of vertigo, and, in severe cases, a tendency to collapse. Therefore it is advisable to begin the treatment with small doses, which should be gradually increased, and promptly reduced or suspended entirely on the appearance of alarming symptoms.

The mental and physical effects of thyrotherapy are very rapid. In a few days the cerebral torpor becomes less marked, the skin reassumes its normal aspect, and the other myxœdematous symptoms become abated.

§ 2. Cretinism

Cretinism may be defined as an arrest of somatic and psychic development dependent generally upon a goiter, and more rarely upon simple atrophy of the thyroid gland.

[1] Briquet. *Valeur comparée des médications thyroïdiennes.* Presse médic., 1902, No. 74.

The affection occurs *endemically* in mountainous regions, such as the Alps, the Rocky Mountains, the high plateaus of Himalaya, Black Forest, etc., and *sporadically* in most regions.

Its *etiology* is not well known. Numerous factors are said to be capable of causing it: atmospheric humidity; certain geological compositions of the soil (cretinism occurs frequently in countries where the soil is composed of schistose clay or of streaked sandstone); poor quality of the water, which in the endemic sections is poorly aërated, deprived of iodine, and charged with calcium and magnesium salts; want; heredity.

All these causes, the influence of which should be kept in view, probably only prepare the soil for the action of some specific agent still unknown. According to the opinion of Griesinger, "endemic goiter and cretinism are specific diseases produced by a toxic cause of miasmatic nature."

The *symptoms* of cretinism usually appear in early childhood. Sometimes the onset is acute, so that the destruction of the gland is accomplished in a few days. Such was the case reported by Shields,[1] in which an acute thyroiditis caused the destruction of the thyroid gland and resulted in cretinism.

Much more frequently the process is insidious, and it is impossible to ascertain the exact date of onset.

The size of the goiter is variable. The swelling may be slight, scarcely perceptible, or so enormous as to completely disable the patient. Resulting usually from a degeneration of the thyroid gland, it becomes evident at about the sixth or eighth year of age and increases up to the time of puberty or even later.

Simple atrophy of the gland is much less frequent and is seen chiefly in sporadic cases.

Physically the cretin exhibits, in addition to the changes in the thyroid gland, the following symptoms: the stature is below the normal; the face is pale, puffed, or marked

[1] *A Case of Cretinism Following an Attack of Acute Thyroiditis.* New York Med. Jour., Oct. 1, 1898.

precociously with senile wrinkles; the pilous system is poorly developed; the mucous membranes are pale, anæmic, and thickened; the teeth are abnormal in shape and implantation and subject to caries; puberty is retarded or even absent, and the cretin may remain infantile all his life.

Psychically we encounter all degrees of idiocy and imbecility. It seems, however, that the cretin is less impulsive, more manageable, and more capable of emotional activity than the ordinary idiot or imbecile.[1]

The brains of cretins present no known specific lesions; asymmetry and various malformations of the hemispheres are frequent.

The *treatment* [2] consists in thyroid medication, the results of which are the more perceptible the earlier it is instituted.

§ 3. Hyperthyroidism: Exophthalmic Goiter

In 1835 Graves, a Dublin physician, described an affection characterized by exophthalmos, swelling of the thyroid gland, and tachycardia. In 1840 Basedow, in Germany, more fully described this affection. It is now generally known either as Grave's disease, Basedow's disease, or exophthalmic goiter. Its underlying disorder seems to be an overaction of the thyroid gland.

In addition to the above-mentioned syndrome patients usually present more or less marked tremor, excessive perspiration, especially of the hands and feet, and they often complain of palpitation and shortness of breath which is made worse by exertion or excitement. In advanced cases there is more or less cachexia.

This affection is of psychiatric interest because the mental condition of those afflicted with it is, as a rule, far from normal. The characteristic mental manifestations are: restlessness; a state of being "on edge," i.e., easily startled, excited, angered, or brought to tears; anxiety; sleeplessness. Very severe cases are sometimes complicated with delirium.

[1] Bourneville. Progrès médical, 1897. [2] *Ibid.*, 1890.

The disease varies in degree. Some cases run a rapid course toward a fatal termination. Others are characterized only by an incomplete syndrome, such as moderate tachycardia (pulse 100–110 per minute at rest) with slight tremor and sweating of palms, but without exophthalmos and without noticeable enlargement of the thyroid gland. Obviously it would hardly be proper to speak of such cases as exophthalmic goiter. Accordingly they are generally spoken of as hyperthyroidism. But they may, under certain conditions, develop into the complete syndrome. Other cases, again, are still milder, being latent under ordinary conditions, but developing characteristic manifestations of hyperthyroidism when exposed to severe and prolonged stress.

All forms of hyperthyroidism are said to be more common in women than in men; but recruiting experiences in the World War have shown that it was more common than had been suspected in men of military age in degrees sufficient to disqualify for military service.

Treatment.—Persons liable to develop hyperthyroidism on exertion should select a sedentary occupation and lead, as far as possible, a life free from excitement or strain.

When symptoms of hyperthyroidism develop, the following measures of treatment, mentioned in the order of their importance and efficacy, should be tried: rest in bed, including mental rest, i.e., freedom from worry or excitement; the administration of belladonna in ascending doses; possibly sodium bromide or trional

Cases which do not recover sufficiently under the above treatment to be able to resume at least light work should be treated surgically. Partial extirpation of the thyroid gland often results in permanent relief. In competent hands and in cases which have not been allowed to become too far advanced the operation is attended with but little danger.[1]

[1] C. H. Mayo. *Surgery of the Thyroid. Observotions on Five Thousand Operotions.* Journ. Amer. Med. Assn., July 5, 1913.

CHAPTER XXI

MISCELLANEOUS GROUPS (*Continued*)

MENTAL DISORDERS DUE TO ORGANIC CEREBRAL AFFECTIONS

All organic cerebral affections, whether diffuse or localized, have an influence upon the psychic functions.

The most important among those which have not already been considered are tumors, multiple sclerosis, brain abscess, and central neuritis.

Tumors, when small and of slow growth, may give rise to no mental symptoms. In other cases the mental state presents certain peculiarities which may aid in the diagnosis: Dupré and Devaux[1] have found that "patients suffering from cerebral tumor present a peculiar state of mental depression and enfeeblement, which constitutes their dominant psychopathic note: this state is one of torpor, *psychic dullness*, and *clouding of the intellect*, to which may be added mental *puerilism*." Properly speaking these cases present no true dementia until the affection has reached its terminal period. According to the same authors[2] "the intelligence, though clouded, is, however, not destroyed. It responds to strong stimuli, to imperious injunctions; it is veiled, but nevertheless present, and not until the last phases of the development of the affection does it decline and finally disappear."

[1] *Nouvelle iconographie de la Salpêtrière. Tumeur cérébrale,* 1901, Nos. 2 and 3, p. 51.

[2] *Loc. cit.*, p. 8.

The *diagnosis* of brain tumor is based chiefly on the neurological symptoms; these are usually classified into *cardinal symptoms*, common to all tumors and resulting from increase of intracranial pressure—severe and persistent headache, slow pulse, vertigo, vomiting, and gradual impairment of vision due to optic neuritis—and *focal symptoms*, varying with the location of the tumor—Jacksonian epilepsy, monoplegia, hemiplegia, aphasia, apraxia, hemianopsia, oculo-motor paralysis, etc.

The differentiation between brain tumor and general paralysis may present considerable difficulty, the more so in view of the fact that in the case of tumors involving the meninges the cerebro-spinal fluid, as in general paralysis, may show an increase of cellular elements. The application of the Wassermann reaction may aid materially in the diagnosis.

Multiple sclerosis may be accompanied by a gradually progressive mental deterioration simulating that of general paralysis. In such cases too the application of the Wassermann reaction may aid in the diagnosis.

Brain abscess occurs chiefly as a complication of chronic purulent otitis media. The *symptoms* are slow pulse, localized headache, fever of the asthenic type, often subnormal temperature; mentally there are dullness, confusion, restlessness, and in severe cases coma. The abscess is generally located either in the temporal lobe—when amnesic aphasia is a prominent symptom if the lesion is on the left side—or in one cerebellar hemisphere—causing vomiting, vertigo, and staggering gait. The *diagnosis* rests upon a history of chronic otitis media, the symptoms here enumerated, and a microscopical examination of the blood which generally reveals leucocytosis; an exploratory operation may be necessary and should be done early in every case in which this condition is suspected.

Central Neuritis.—Cases of this highly interesting though rather rare condition have been reported by Wigles-

worth,[1] Meyer,[2] Worcester,[3] Turner,[4] Cotton and Southard,[5] Somers and Lambert,[6] and others. The first systematic clinical and anatomical study was made by Meyer.[7]

Although clinically this condition is not very well defined and varies a good deal in its aspect, the anatomical changes found *post mortem* are highly characteristic and constitute the basis of its autonomy.

These changes are revealed only on microscopic examination and consist in widespread parenchymatous degeneration of the central nervous system unaccompanied by any inflammatory reaction. Large nerve cells, especially those in the motor area of the cortex in both cerebral hemispheres, present the so-called axonal alteration: the cell body is somewhat swollen; the stainable substance, especially in the central part of the cell, is converted into a diffusely staining, structureless, or into a finely powdered, mass; the nucleus is pushed toward the periphery of the cell and may be slightly flattened or distorted. Marchi preparations reveal corresponding degeneration of fiber tracts, particularly those connected with the motor cortical areas.

The *nature* of central neuritis is not understood, and but little is known of its *etiology*. Most cases that have been reported occurred in institution practice either as terminal

[1] J. Wiglesworth. *On the Pathology of Certain Cases of Melancholia Attonita, or Acute Dementia.* Journ. of Ment. Sc., Oct., 1883.

[2] Adolf Meyer. *Demonstrations of Various Types of Changes in the Giant Cells of the Paracentral Lobules.* Amer. Journ. of Ins., Oct., 1897.

[3] W. L Worcester. *A Case of Landry's Paralysis.* Journ. of Nerv. and Ment. Dis., 1897.

[4] John Turner. *Note on a Form of Dementia Associated with a Definite Change in the Appearance of the Pyramidal and Giant-Cells of the Brain.* Brain, 1899.

[5] H. A. Cotton and E. E. Southard. *A Case of Central Neuritis with Autopsy.* Trans. of the Amer. Med.-Psychol. Assn., 1908.

[6] E. M. Somers and C. I. Lambert. *Central Neuritis.* State Hosp. Bulletin, December, 1908.

[7] Adolf Meyer. *On Parenchymatous Systemic Degenerations Mainly in the Central Nervous System.* Brain, 1901.

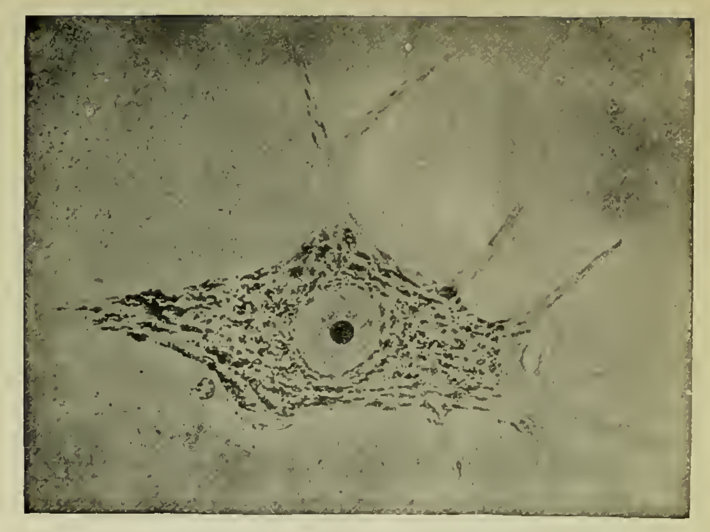


Fig. 5.—Normal Betz Cell. (After Adolf Meyer.)



Fig. 6.—Cell from a Case of Central Neuritis, showing Axonal Alteration. (After Adolf Meyer.)

episodes in some chronic psychoses or in connection with acute mental confusion. It affects both sexes, chiefly in the fifth and sixth decades of life or thereabouts. In most of the cases no exciting cause is assigned; in a considerable number the trouble is said to have followed an attack of influenza, and in three cases it followed slight surgical operations done under general anæsthesia.

Singer and Pollock [1] found the lesions of central neuritis in a series of twelve cases of pellagra dying during the acute or subsiding stages of the pellagrous attack. "Seven of them died at a short interval after the skin lesions had subsided, with clinical symptoms of central neuritis. In the other five there were no symptoms, such as evidence of pyramidal tract lesion (Babinski reflex, jactatoid spasms, etc.), to suggest central neuritis, although diarrhœa with rapid and progressive emaciation and weakness were almost always present." This, of course, suggests the possibility of an essential connection between central neuritis and pellagra which had been previously overlooked.

The *mental symptoms*, given in the order of their frequency, are: depression with anxiety or sudden apprehensiveness; restlessness and agitation; perplexity, confusion; hypochondriacal or persecutory delusions, often of an extremely absurd character; hallucinations. Refusal of food has occurred in more than half of the cases, and suicidal tendency is almost as common.

Among the *physical symptoms* the most striking are: stumbling, falling, unsteady gait; peculiar seizures—faintness, violent shaking, rigidity; muscular twitchings, irregular jerky movements, jactations; maladjustment in all movements; the knee-jerks are most frequently exaggerated, but in some cases they are diminished or even absent; the speech is apt to become very indistinct; toward the last, dysphagia; in some cases there is little or no reaction to pin-pricks. The general constitutional disturbance is

[1] Singer and Pollock. *The Histopathology of the Nervous System in Pellagra.* Archives of Internal Medicine, June, 1913.

grave: there is usually emaciation which may be extreme; diarrhœa has been observed in nearly three-fourths of the cases; a slight, irregular febrile reaction appears, the patient becomes exhausted, falls into stupor, and dies; in some cases death follows a sudden turn for the worse or actual collapse.

CHAPTER XXII

MISCELLANEOUS GROUPS (*Concluded*)

SENILE DEMENTIA

SENILE dementia may be defined as a peculiar state of mental deterioration, with or without delusions, resulting from cerebral lesions determined by senility.

Age is here, therefore, the great etiological factor; it is, however, not the sole factor. Many attain extreme old age without presenting any appreciable intellectual disorders; others, on the contrary, have scarcely passed over the threshold of senility when they are already veritable dements.[1] The effects of age are the more powerful and the more precocious the more marked the predisposition. Heredity, the intoxications (alcoholism), overwork, violent and painful emotions, traumatisms, etc., are also given as causes.

Statistics furnish a rather small proportion of congenitally predisposed persons among senile dements, but this is perhaps partly due to the fact that it is frequently impossible to obtain reliable family histories in such cases.

Senile dementia is rare before the age of sixty years. Alcoholism sometimes brings about an analogous state of mental deterioration, appearing toward fifty or fifty-five years, which has been designated by the term *sænium præcox*.[2] Such cases are exceptional if we exclude ordinary alcoholic dementia.

[1] Russell. *Senility and Senile Dementia*. Amer. Journ. of Insanity, 1902.

[2] Cases essentially of premature senility have been described under the name of *Alzheimer's disease*. See Alzheimer. *Ueber eigenartige*

The *onset* sometimes follows some strong emotional shock, financial troubles, or a somatic affection. Almost always it is insidious, marked simply by a change of disposition and slight disorders of memory. When fully established the dementia presents the following fundamental elements:

(*a*) *Impairment of attention and sluggishness of association of ideas*, readily demonstrable by psychometry, as has been shown by the experiments of Rauschburg and Balint.[1] (These authors performed their experiments upon cases of simple senile dementia without delusions.) A curious fact observed in these experiments is that associations of ideas were almost always determined by the sense of the words, and rarely by similarities of sound or by rhymes. It will be remembered that associations by similarities of sound are the result of automatic psychic activity; it seems, therefore, that mental automatism, instead of being exaggerated, as it is in certain psychoses (mania), is, like voluntary psychic activity, diminished, at least in simple senile dementia without delusions.

(*b*) *Inaccurate and incomplete perception*, the consequence of which is the production of numerous illusions and of disorientation of place.

(*c*) *Disorders of memory*, comprising:

(I) *Amnesia of fixation* (anterograde amnesia), which entails disorientation of time;

krankheitsfälle des späteren Alters. Zeitschr. f. d. gesamte Neurol. u. Psychiatrie, Vol. IV, p. 365.—Perusini. *Ueber klinisch und histologisch eigenartige psychische Erkrankungen des späteren Lebensalters.* Nissl's Arbeiten, Vol. II, p. 297.—S. C. Fuller. *A Study of the Miliary Plaques Found in Brains of the Aged.* Amer. Journ. of Ins., Oct., 1911.—S. C. Fuller. *Alzheimer's Disease (Senium Præcox): The Report of a Case and Review of all Published Cases.* Journ. of Nerv. and Ment. Dis., Vol. XXXIX, 1912.—S. C. Fuller and H. I. Klopp. *Further Observotions on Alzheimer's Disease.* Amer. Journ. of Ins., July, 1912. —W. J. Tiffany. *The Occurrence of Miliary Plaques in Senile Brains.* Amer. Journ. of Ins., Jan., 1914.

[1] *Ueber qualitative und quantitotive*, etc. Allgem. Zeitsch. für Psychiat., 1900.

(II) *Amnesia of conservation* (retrograde amnesia), which is progressive and which follows almost perfectly the law of retrogression;

(III) *Illusions and hallucinations of memory*, which form the basis of pseudo-reminiscences, often absurd or puerile in character and varying from one instant to another.

(*d*) *Impoverishment of the stock of ideas:* old impressions disappear and are not replaced by new ones. This is the cause of the tiresome repetitions in the discourses of old dotards.

(*e*) *Loss of judgment:* the patient does not accept new points of view. He mourns for the good old times and shows a profound contempt for new ideas which he is incapable of assimilating. This contempt for the present is met with in many old people and not necessarily in combination with any appreciable mental deterioration.

The senile dement has no realization of his own condition. Often he boasts of his endurance, strong will, lucid mind, and declares that he is in no need of assistance from anyone and is quite able to manage his own affairs.

(*f*) *Diminution of affectivity, morbid irritability:* hence the indifference of senile dements for their relatives and their interests, their unprovoked outbursts of anger, their tyrannical tendencies, and their occasional emotionalism.

(*g*) *Automatic character of reactions:* from this point of view senile dements may be divided into two classes: the *turbulent* and the *apathetic*.

The *turbulent* are always moving, intrude everywhere, give unreasonable or contradictory orders, get up during the night and wander about the house with a candle in their hand at the risk of starting a fire. Their mood is either depressed or elated and hypomaniacal. Sexual excitement, most often purely psychic, is quite likely to be associated with this state, and, together with the mental deterioration, leads the patient to dangerous acts: attempts of rape, indecent exposures, etc.

The *apathetic* senile dements have an indifferent, stupid

aspect. The patient's mouth, half open, allows the saliva to dribble; he remains motionless upon the chair where he has been placed; he is docile, obedient, and very suggestible. In the hands of unscrupulous persons he allows himself without protestation to be swindled and maltreated, and unconsciously yields to inveiglements for imprudent disposal of his property.

In advanced stages of the disease turbulent as well as apathetic senile dements frequently become *filthy*, often soiling and wetting themselves.

Sleep is diminished and often even absent in the excited forms. On the other hand, constant somnolence is frequent in the apathetic cases.

Together with the dementia there are the regular signs of senility. The skin is wrinkled and discolored; the hairy system is undergoing atrophy; the patellar reflexes are sometimes abolished, but more frequently exaggerated; the pupils are slightly myotic and paretic; *arcus senilis* is well marked; there is hypoæsthesia of all the senses; all movements are awkward and uncertain; there is diminution of the muscular power; senile tremors affect the entire body and especially the head, consisting of coarse oscillations.

The *cardio-vascular* symptoms are of great importance.

The frequent association of senile dementia with arteriosclerosis has already been mentioned. Vascular disease is, however, not invariably present and is often but slight: senile atrophy is a process essentially independent of arteriosclerosis.

The *appetite* is diminished, or, on the contrary, it may be exaggerated to a degree constituting voracity. In the latter case the patient's diet should be carefully regulated to prevent grave gastro-intestinal disturbances.

Delusional Forms.—The delusions bear the stamp of dementia: they are absurd, changeable, and present little or no tendency to systematization. They may be of the following varieties:

(*a*) *Ideas of persecution*, which in their mildest form

manifest themselves by mere suspiciousness such as is always common in old persons. Their form is varied: ideas of poisoning, theft, jealousy, fear of being killed, etc.

Persecutory ideas are more likely to become systematized than any others, though the systematization is very imperfect; and more likely to be accompanied by hallucinations, chiefly of hearing and vision. Sometimes these delusions appear long before any evidences of dementia, constituting the *presenile paranoid state* (*Præseniler Beeinträchtigungswahn*) of Kraepelin.

(*b*) *Melancholy ideas* of all possible types: ideas of self-accusation, of ruin, etc. Ideas of negation are very frequent.

(*c*) *Ideas of grandeur*, which are at times absurd, resembling those of general paralytics.

The delusions are associated with a corresponding state of the emotions and of the reactions. Three principal forms of delusional senile dementia may be distinguished:

(1) *Persecutory form:* ideas of persecution; reactions of self-defense which may at times be violent.

(2) *Depressed form:* melancholy ideas, psychic pain, depression, anxiety, suicidal ideas.

(3) *Maniacal form:* euphoria, ideas of grandeur, variable moods, impulsive reactions, sometimes flight of ideas, erotic tendencies, etc.

Senile dementia is sometimes marked by acute attacks characterized by complete disorientation and hallucinations, closely resembling certain phases of general paralysis, but especially delirium tremens (*senile delirium*). These attacks, usually very brief, terminate either in death or in a return to the previous condition. They may occur in old persons independently of senile dementia (Wernicke).

The principal *complications* of senile dementia are:

Apoplectic and sometimes *epileptic seizures* (senile epilepsy), hemiplegia, aphasic phenomena, etc.

Alcoholism in the form of episodic accidents (delirium tremens) or of alcoholic dementia may be associated with senile dementia.

The *prognosis* is fatal. The affection always follows a progressive course. Remissions are very rare and never complete. Death usually supervenes at the end of from three to five years, as a result of senile cachexia, some intercurrent disease (pneumonia), or apoplexy.

Not all psychoses occurring at an advanced age are senile dementia. Old men present attacks of manic-depressive psychoses, paranoia, and other psychoses which differ in no way from those observed in younger people.[1]

The *diagnosis* is based upon the pathognomonic features of the dementia.

Involutional melancholia and *manic-depressive psychoses* may be distinguished by the absence of mental deterioration, by the preservation of lucidity, and by the intensity of the affective phenomena—psychic pain or euphoria.

General paralysis may be differentiated by the more rapid development of dementia and by its special physical signs.

Alcoholic dementia shows the physical signs of chronic alcoholism: muscular pain, tremors, gastric disorders, etc. Senile dementia and alcoholic dementia may exist together.

The *anatomical lesions* arise from a process of wear and atrophy: atheroma of the cerebral arteries, thickening of the meninges, diminution of the weight of the brain, which may sometimes fall below 1000 grams; thinning of the cortex; numerous miliary plaques; diminution of the number of nerve-cells, chromatolysis, pigmentary degeneration, atrophy; disappearance of a large number of tangential fibers.

The *treatment*, purely symptomatic, consists chiefly in hygienic measures. Commitment is but seldom necessary. The majority of cases are best treated in special asylums for the aged or in private homes.

[3] Thivet. *Contribution à l'étude de la folie chez les vieillards.* Thèse de Paris, 1889.—Régis. *Psychoses de la vieillesse.* Ann. méd. psych., March–April, 1897.—Ritti. *Les psychoses de la vieillesse.* Congrès des médecins aliénistes et neurologistes, 1896.

PART III

APPENDICES DEALING WITH TECHNIQUE OF SPECIAL DIAGNOSTIC PROCEDURES

APPENDIX I

LUMBAR PUNCTURE—CELL COUNT—CHEMICAL TESTS

Lumbar puncture is a simple and harmless procedure. The only danger, that of infection, can be entirely avoided by the exercise of ordinary precautions of asepsis.

The only contraindication is high intracranial pressure. Patients who have brain tumor with signs of increased intracranial pressure, especially choked disc, should be punctured only when this is deemed absolutely necessary for differential diagnosis, and then not more than 2 c.c. of spinal fluid should be withdrawn. Death, caused by hernia of the medulla and midbrain into the foramen magnum, has followed withdrawal of large amounts of fluid in such cases.[1]

The patient is placed on a convenient table, or a board is inserted under the mattress of his bed. He lies on his side, with the back arched as much as possible and with knees drawn up so that they almost touch his chin. The patient may aid this arching of the back by placing his hands behind the knees and exerting a strong pull. An assistant can keep a restless patient from moving by placing one hand on the nape of his neck and the other behind the knees and thus holding him firmly. Very restless and excited patients must be given a general anæsthetic.

[1] Minet and Lavoit. *La mort suite de ponction lombaire.* L'Écho médical du Nord, Apr. 25, 1909.

Two conditions are essential: the back must not be arched in, but out, and the alignment of the vertebræ must not be scoliotic, but straight. The back is then sterilized with some tincture of iodine, which is removed with a little alcohol. The operator's hands are, of course, also properly sterilized. To mitigate the slight pain incident to piercing the skin, the latter may be anæsthetized with ethyl chloride.

A lumbar puncture needle, sterilized in an oven by dry heat at 150° C. for half an hour, is used. It is best to have several such needles on hand. They can be conveniently placed in cotton-stoppered test-tubes, and if the oven temperature cannot be accurately observed by thermometer it is sufficient to roast them until the cotton begins to turn brown.

This method of sterilization is preferable to boiling the needles, as it is desirable to have them quite dry. Globulin, the detection of which is the object of some of the spinal fluid tests, is precipitated by water. Boiled needles may be used, however, but in that case it is best to discard the first three or four drops of spinal fluid.

The needle should be about 4½ inches long and not larger than gauge 18 nor smaller than gauge 22 of the Brown & Sharpe standard.

The needle is introduced straight into the space between the laminæ of the fourth and fifth lumbar vertebræ. This interspace is found by drawing an imaginary line joining the iliac crests. Should this interspace, upon palpation, prove small or narrow, the one above or the one below may be selected instead. The needle is introduced at a point in the midline or a trifle to one side, just below the tip of the corresponding vertebral spine.

Extending from the level of the upper border of the second lumbar vertebra to that of the sacrum is a large meningeal reservoir in which are contained the fibers of the *cauda equina*. These fibers are loosely held in place and are therefore not injured by the point of the needle. Should the needle touch them, the patient is apt to complain of shooting pains and cramps in the legs. This is no reason

for interrupting the procedure. The pain can be eliminated by gently rotating the needle through half a turn.

If in the process of introduction it is felt that the needle is about to strike bone, no attempt should be made to push it further, for then the very sensitive periosteum would be scraped. The operator can easily tell when the needle is about to come in contact with bone, as the resistance of the tendons and ligaments near the vertebræ is greater than that of the more superficial tissues. It is best to withdraw the needle entirely and to try again with another needle.

In some cases it is impossible to get the back of the patient properly arched and aligned. Consequently the projecting spines almost obliterate the small intervertebral spaces. The only possibility of performing lumbar puncture in such a case is by directing the needle at an angle upward. Every puncture should be preceded by a careful palpation of the interspaces. Thus the widest interspace may be selected and the operator must judge, according to the patient's position, at what angle to introduce the needle. The direction of the needle may be changed only after withdrawing it to a level just under the skin, otherwise one runs the risk of impacting it and breaking it off.

A decrease in resistance gives an indication when the meningeal reservoir has been reached and when the stylet is to be withdrawn from the needle. Often the dura gives way with a perceptible pop. A mistake often made is to push the needle too far into the spinal canal; thus the venous plexus at the ventral part of the canal is injured and contamination of the fluid with blood results. Such a specimen can be used only for the Wassermann reaction. It is useless for those tests which presuppose freedom from contamination with such blood constituents as serum albumin and globulin and cellular elements.

Sometimes the needle becomes clogged after some fluid has been collected. In such cases the stylet is reinserted and the needle is turned gently.

About 5 or 6 c.c. of the fluid are collected in a sterile test-tube. It is not advisable to withdraw more for diagnostic purposes, as patients are apt to develop severe headache, faintness, dizziness, or vomiting if too much fluid is withdrawn. Indeed, headache sometimes follows the best technique and greatest care. However, it seldom lasts over a few days.

After lumbar puncture the patient should remain in bed for at least twenty-four hours. Should the above-mentioned symptoms appear and persist, two or three days' rest in bed may be required.

The following are the most useful procedures for examining spinal fluid for psychiatric diagnosis: (*a*) Cell count. (*b*) Lange's colloidal gold test. (*c*) Special protein tests (Noguchi, Ross-Jones, Pandy). (*d*) Wassermann reaction (described in Appendix II).

(*a*) The **cell count** must be done immediately after the fluid has been collected, as the cells soon undergo autolytic action outside of the body.

The following equipment is required: (1) Mixing pipette like that used for making white blood-corpuscle counts. (2) Fuchs-Rosenthal counting chamber, ruled as illustrated in Fig. 7.[1] (3) Clinical microscope, preferably with mechanical stage. (4) The following staining solution:

Methyl-violet....................	0.2 gram
Acetic acid......................	4.0 c.c.
Distilled water..................	96.0 c.c.

Shake well and filter before using.

The staining solution is drawn into the pipette up to mark 1, and then the spinal fluid, after being thoroughly shaken to insure uniform suspension of the cells, up to mark 11; the pipette is then shaken for about five minutes to mix the stain thoroughly with the fluid.

As that part of the fluid which is in the stem of the pipette does not become mixed with that in the bulb, and is drained

[1] Excellent counting chambers of American manufacture are to be had from Max Levy, Philadelphia.

off before a drop is taken out for the counting chamber, the dilution in the bulb, in calculating the results, is to be considered as in the proportion of 9 parts of spinal fluid to 1 of the staining solution.

After draining off the fluid in the stem of the pipette—three drops—a drop of suitable size is placed in the counting chamber and a cover glass put on; or, still better, if one of the new counting chambers of American manufacture is

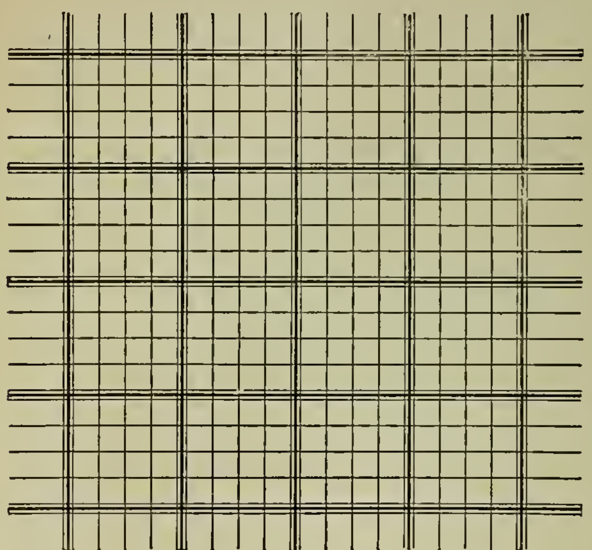


Fig. 7.—Ruling of Fuchs-Rosenthal Counting Chamber.

used, a drop is allowed to flow in by capillary attraction. It is best to let the fluid stand in the counting chamber about a minute before the counting is begun; this permits the cells to settle on the bottom so as to be as nearly as possible in the same focus as the ruling of the chamber.

The count is made most conveniently under rather low magnifying power of the microscope, say, 16 mm. objective, 10× eye-piece, Bausch & Lomb.

The dimensions of the counting chamber are 4 mm. on

each side and 0.2 mm. in depth, i.e., 3.2 cu.mm. As but nine-tenths of the mixture in the counting chamber is spinal fluid, the remaining one-tenth being staining solution, all the cells counted in one chamber represent the cell content of 2.88 cu.mm. of spinal fluid. It is customary to express the findings in number of cells per cubic millimeter of spinal fluid; and this is derived, of course, by dividing the total number of cells counted over the entire ruled area of a Fuchs-Rosenthal chamber by 2.88.

It is advisable to make two or three counts with different drops and to report the calculated average rather than the result of a single count.

The number of cells per cu.mm. of spinal fluid varies considerably both in health and disease, and there is no definite point of demarcation between the two. Most pathologists consider any number under 5 as a negative finding, between 5 and 8 as doubtful, and over 8 as positive.

The staining solution, for which the formula is given above, will enable one to differentiate between white and red corpuscles. The small mononuclear elements assume a deep blue color with a narrow lighter rim of cytoplasm. Red cells appear light colored, hyalin, translucent. Polymorphonuclear elements are recognized by their nuclei. It would be easy to dissolve all red cells by adding more acetic acid to the staining solution. We have purposely not done this, as it is an advantage to be able to count red cells as well as white ones and thus have a measure of the contamination with blood that there might be. If more than 20 red cells per cu.mm. are found, the cell count as well as the colloidal gold and other protein tests are not to be relied on.

In cases in which clinical data would lead the physician to expect a positive finding, while the reported finding is either doubtful or negative, the lumbar puncture may be repeated at the end of ten days. Either on first or second examination almost all cases of general paralysis and cerebral syphilis furnish positive findings, while most other psychoses furnish negative ones. In all acute infections of the meninges polymorphonuclear cells are found.

(*b*) **Lange's Colloidal Gold Test.**[1]—The reagent is prepared as follows: One uses water which has been thrice distilled, and, in being distilled, has not been allowed to come in contact with rubber connections, all connections of the distilling apparatus being of cork which has been well boiled beforehand. An apparatus like that described by Miller, Brush, Hammers, and Felton[2] is very useful. Three hundred c.c. of such thrice-distilled water is put into a beaker of Pyrex or Jena glass, and the beaker is placed on wire gauze over a hot flame. When the water has reached the temperature of 60° C. 3 c.c. of a 1% solution of gold chloride in similarly thrice-distilled water is added. Following this 2.1 c.c. of a 2% solution of potassium carbonate of the highest purity is added. The solution is then brought quickly to 90° C. At this point 2.1 c.c. of a 1% solution of formaldehyde is added gradually while stirring. This is prepared by diluting 1 c.c. of commercial formaldehyde solution (40%) with 39 c.c. of thrice-distilled water. The whole is kept at a temperature of 90° C. until a pink tinge appears; the beaker is then removed from the flame and the reaction allowed to complete itself. It should not be allowed to boil violently at any time, but may bubble gently. The solution thus prepared should be perfectly clear and without a bluish tinge. It will keep for weeks or months.

Before using the solution is tested as follows: 5 c.c. are put into each of three small test-tubes; then 0.5 c.c. of a 1% sodium chloride solution is added to the first tube, 1.0 c.c. to the second, and 1.7 c.c. to the third. The first tube should show no change in color at the end of an hour, the second should assume a blue tinge, and the third should show complete precipitation with colorless supernatant fluid.

If this titration is satisfactory, the solution is further

[1] Carl Lange. *Die Ausflokkung kolloidalen Goldes durch Cerebrospinalflüssigkeit bei syphilitischen Affectionen des Centralnervensystems.* Zeitschr. f. Chemotherapie, No. 1, 1912.—Kaplan and McClelland. *The Precipitation of Colloidol Gold.* Journ. Amer. Med. Assn., Feb. 14, 1914.

[2] Miller, Brush, Hammers, and Felton. Bulletin of Johns Hopkins Hospital, Vol. XXVI, p. 391, 1915.

tested with a specimen of spinal fluid known to have given a paretic curve.

If the above titration is unsatisfactory, it is advisable to determine the reaction of the solution with the aid of alizarin red. Both alkalinity and acidity interfere with the reaction, the one retarding and the other hastening it. If found necessary, therefore, the reagent should be neutralized with N/50 hydrochloric acid or sodium hydroxide, as the case might be, using alizarin red as indicator. It is then again titrated with sodium chloride solution, as described above. If the titration is still unsatisfactory, then something may be judged to be wrong either with the chemicals used or with the technique, and a new solution has to be made.

The only other solution required is 0.4% sodium chloride in thrice-distilled water.

The test is performed in the following way: ten small test-tubes are placed in a rack; one puts 1.8 c.c. of the 0.4% sodium chloride solution in the first test-tube in the rack and 1 c.c. in each of the other nine. 0.2 c.c. of the spinal fluid is then put into the first test-tube, making therein a dilution of 1 : 10; from this 1 c.c. is taken out and put into the second test-tube, making therein a dilution of 1 : 20; this is repeated until the entire series of tubes contain dilutions of the spinal fluid of descending strengths, that in the tenth tube being a dilution of 1 : 5120. In order to make the volume of the mixture in the tenth tube the same as in the other tubes, 1 c.c. is taken out and thrown away. To each tube is now added 5 c.c. of the colloidal gold solution, the mixture shaken up, and the rack left to stand at room temperature for twenty-four hours, at the end of which time the reading is taken.

In recording the reading it is customary to distinguish five degrees of intensity of reaction: a negative reaction leaves the fluid in the test-tube salamander red in color, as in the beginning, and is designated 0; a slightly positive reaction is indicated by a reddish-blue color, and is designated 1; a somewhat more strongly positive reaction renders the fluid

purple, and is designated 2; the next intensity of reaction is indicated by a blue color, and is designated 3; the next again by a pale blue color, and is designated 4; and the strongest intensity of reaction, marked by complete precipitation, is indicated by a colorless condition of the supernatant fluid, and is designated 5.

The colloidal gold test is essentially a measure of the relationship between the globulins and albumins in the spinal fluid.[1] Fluids with a large globulin content and little or no albumin give *paretic curves*, like the general type shown

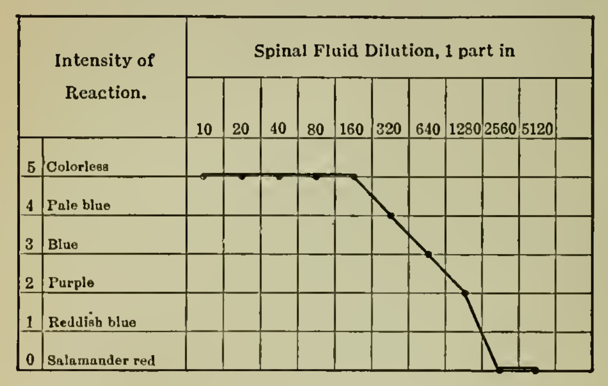


Fig. 8.—Collodial Gold Test: Paretic Curve.

in Fig. 8. This curve, expressed in numerals, would read: 5555543200. Such curves are most frequently obtained in cases of general paralysis. Some other conditions, notably multiple sclerosis and lead poisoning with brain involvement, sometimes furnish similar curves.

Fluids with limited globulin and moderate albumin content give *luetic curves*, like the general type shown in Fig. 9. This curve, expressed in numerals, would read: 1133100000. It is most frequently found in tabes and endarteritic and gummatous forms of cerebro-spinal syphilis. It may also be

[1] Felton. *A Study of the Specificity of the Colloidal Gold Reaction from the Physico-Chemical Standpoint.* Journ. Amer. Med. Assn., 1917.

found in cases of brain tumor, cerebral arteriosclerosis, poliomyelitis, etc.

Intensity of Reaction.
Spinal Fluid Dilution, 1 part in
10 20 40 80 160 320 640 1280 2560 5120
5 Colorless
4 Pale blue
3 Blue
2 Purple
1 Reddish blue
0 Salamander red

FIG. 9.—Colloidal Gold Test: Luetic Curve.

Fluids containing large amounts of both globulin and albumin give *meningitic curves*, like the general type shown in Fig. 10. This curve expressed in numerals, would read: 1234553100. It is the least helpful of all curves as far as definite diagnosis is concerned. All meningitic conditions, be they of syphilitic, tubercular, or acute infectious nature, show curves of this general type.

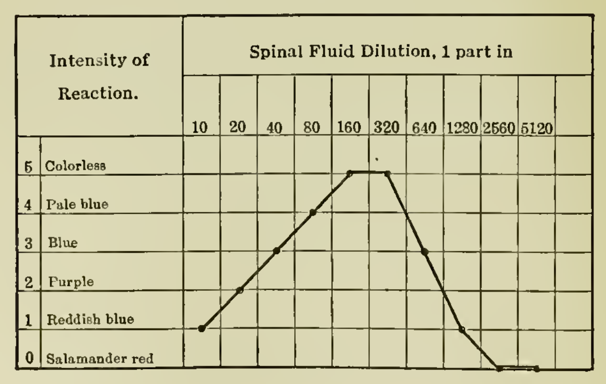


FIG. 10.—Colloidal Gold Test: Meningtic Curve.

(*c*) **Special Protein Tests.**—*Noguchi's Butyric Acid Test.*[1] —To 0.2 c.c. of cerebro-spinal fluid in a small test-tube is added 0.5 c.c. of an aqueous solution containing 10% of butyric acid and 0.9% of sodium chloride, and the mixture is heated over a flame until it boils; while it is still hot 0.1 c.c. of a 4% solution of sodium hydroxide is added and the mixture is boiled again. A positive result is indicated by the appearance at once or after a few minutes of a finely granular or flocculent precipitate which settles in a little while, the supernatant fluid remaining clear. If no precipitate forms or if only a diffuse opalescence develops which does not subside on standing, the reaction is recorded as negative.

Ross-Jones Ammonium Sulphate Test.[2]—Upon 2 c.c. of a hot saturated solution of ammonium sulphate, which has been allowed to cool in the test-tube, 1 c.c. of cerebro-spinal fluid is allowed to flow gently from a pipette in such a manner that it will form a layer floating on top. The reaction is positive if within a few minutes a thin grayish ring is formed at the junction of the two liquids. After standing the ring becomes thicker and on close examination in a suitable light against a dark background may be seen to be made up of a fine network of cobweb-like appearance.

Pandy's Phenol Test.[3]—The reagent is prepared as follows: Eighty c.c. of pure carbolic acid are dissolved in 1000 c.c. of distilled water. This mixture is well shaken and allowed to stand several days at room temperature. The supernatant clear solution is then pipetted off. About 3 c.c. of this solution is poured into a small test-tube and three drops of spinal fluid are added. The spinal fluid, which is of higher specific gravity than the reagent, falls to the bottom. A positive reaction is indicated by a distinct streak of cloudiness in the course of the spinal fluid through the reagent.

[1] Noguchi and Moore. Journ. Exp. Med., 1909, p. 604.—Rosanoff and Wiseman. *Syphilis and Insanity.* Amer. Journ. of Insanity, Vol. LXVI, 1910, p. 419.

[2] British Med. Journ., 1909, Vol. I, p. 1111.

[3] D. Kaplan. *Serology of Nervous and Mental Diseases:* Philadelphia, 1914.

APPENDIX II

WASSERMANN REACTION

Principle of the Wassermann Reaction.—When blood corpuscles of an animal of a given species are injected into an animal of a foreign species the blood serum of the second animal develops the power of destroying the corpuscles of animals of the first species, that is to say, a *specific hæmolytic power.*

When the serum of an animal thus immunized is heated for an hour at 56° C., or when it has been allowed to stand at room temperature for twenty-four hours, it loses its hæmolytic power, technically it is said to have become *inactivated.* It may, however, be *reactivated,* that is to say, its hæmolytic power may be restored, by the addition of serum from another animal,—one which has not been immunized and the serum from which, therefore, does not by itself possess hæmolytic power.

It is concluded from these facts that the hæmolytic power of the serum of an immunized animal is dependent upon two substances: one which is chemically unstable (being easily destroyed by moderate heat or by standing at room temperature) and non-specific (being present in fresh serum of non-immunized animals as shown by reactivation), and another which is chemically stable (resisting the effect of moderate heating, etc.) and strictly specific (being present only in the serum of animals which have been immunized by injections of corpuscles). The first substance is called *complement,* the second *amboceptor.*

For specific hæmolysis to occur, then, the following ingredients are required, constituting a *hæmolytic system*:

blood corpuscles + complement + hæmolytic amboceptor.

In the case of bacteria the mechanism of immunization is similar; accordingly, the essential ingredients in a reaction of specific bacteriolysis, constituting a *bacteriolytic system*, are:

bacteria + complement + bacteriolytic amboceptor.

It was shown by Bordet and Gengou that in any bacteriolytic reaction a definite proportion of complement is used up, and that the amount of complement thus " absorbed " or " fixed " may be used as a measure of the immunity reaction. So that if upon mixing in a test-tube suspension of bacteria, complement, and bacteriolytic amboceptor we wish to determine whether bacteriolysis has taken place, we may do so simply by testing for the presence of complement; its absence would prove that it has been used up and that the immunity reaction has taken place, while its presence would prove that such reaction has not taken place.

The test for complement is done simply by adding blood corpuscles and hæmolytic amboceptor; in the presence of complement hæmolysis will occur, in its absence it will, of course, not occur.

The application of the phenomenon of fixation of complement with resulting inhibition of hæmolysis, known as the Bordet-Gengou phenomenon, in a test for syphilis is due to Wassermann.

In the case of syphilis the ingredients of the immunity reaction are:

syphilitic antigen [1] + complement + syphilitic amboceptor.

[1] *Antigen* is a general term applied to all bodies, such as bacteria, blood corpuscles, etc., which are capable to exciting the generation of specific antibodies. The *Treponema pallidum* not having at that time been successfully cultivated on artificial media, Wassermann employed as syphilitic antigen watery extract of livers from congenitally syphilitic infants. It has since been found that certain lipoid substances which may be extracted from normal body tissues, curiously enough, possess in a greater degree than true syphilitic antigen, the property of binding complement. Such lipoids are now exclusively employed as antigen in the reaction. It is to be judged from this that

The actual test is performed in two stages. In the first stage syphilitic antigen, complement, and the serum to be tested are brought together; if the serum contains syphilitic amboceptor the reaction will take place and complement will, consequently, be used up; if the serum does not contain syphilitic amboceptor the reaction will not take place and complement will therefore remain free. The second stage of the reaction consists simply in the addition of blood corpuscles and hæmolytic amboccptor to test for complement; in the case of a syphilitic serum, complement, having been used up in the first stage of the reaction, will not be available for the hæmolytic system and there will be no hæmolysis; in the case of a non-syphilitic serum, complement will remain free after the first stage of the test; it will therefore be available for the hæmolytic system, and hæmolysis will take place.

Preparation of Reagents.—*Complement* is derived from fresh guinea-pig serum, the following being the most convenient way. A full-grown guinea pig is held by an assistant over a large Petri dish in a hyperextended position by grasping the head with one hand and all the four legs with the other. A long slender sharp knife is introduced into the neck at the side just in front of the vertebral column until it is thrust through on the other side, when the edge of the blade is turned ventrally and all the tissues in the front part of the neck are cut through. The blood is caught in the Petri dish, which is then covered and set aside in a corner out of direct sunlight and allowed to stand at room temperature for about two hours, at the end of which time the serum may be poured off and used; or the Petri dish may at the end of two hours be placed in the refrigerator where it may be kept overnight and used on the following morning; but standing overnight at room temperature renders the serum inactive. If kept on ice the activity of the serum is reduced much more

the Wassermann reaetion is not really an instance of the Bordet-Gengou phenomenon, but a purely empirieal and unexplained test for syphilis whieh, moreover, is not strictly speeific.

slowly, so that it usually remains good for about forty-eight hours.

In performing the test 0.1 c.c. of this serum is used. Guinea-pig serum is very rich in complement, so that the amount used in the test is really in excess of that actually required for complete hæmolysis.

It is customary to use *sheep corpuscles* in the hæmolytic system. The blood of a freshly slaughtered sheep is collected in a sterile vessel, defibrinated, centrifuged, and the corpuscles washed at least five times with 0.9% sodium chloride solution in distilled water, by pouring off the supernatant serum or salt solution, adding fresh salt solution, shaking the centrifuge tube, and centrifuging again. The washed sheep corpuscles are used in immunizing rabbits for the preparation of anti-sheep amboceptor; for this purpose one adds to the corpuscles in the sedimentation tube only about as much salt solution as would suffice to bring the corpuscle suspension to the original concentration of the blood, i.e., two parts by volume of the corpuscles in the sedimentation tube to one part of salt solution. The sheep corpuscles are also used as a reagent in the reaction; for this purpose a weaker suspension is prepared containing but five parts by volume to ninety-five of salt solution.

Anti-sheep hæmolytic amboceptor is derived from the blood serum of a rabbit which has been immunized by two injections of 5 and 8 c.c. of sheep corpuscles respectively, in the above-mentioned concentration, at an interval of five days. A full-grown male rabbit weighing about 5 pounds is preferred, and the injections are made into the ear vein with a 10-c.c. syringe. To facilitate the injections the assistant holding the rabbit places his thumb at the root of the ear, thus impeding the blood return and rendering the vein prominent. A needle about 2 inches long, gauge 20, is used. Subcutaneous injection is useless and may simply result in a slough; therefore, if, as the injection is begun, a swelling forms, the needle must be either readjusted or reinserted until proper penetration into the vein is assured. On the

ninth day after the second injection a small amount of blood is withdrawn, centrifuged, and the serum tested for hæmolytic power. If a dilution of 1 : 1500 is capable of hæmolyzing with the aid of guinea-pig complement a 5% suspension of sheep corpuscles in about half an hour, then the rabbit is ready for bleeding. If not, it may be necessary to give a third injection of sheep corpuscles and again wait eight or nine days. When this preliminary test gives a satisfactory result, the rabbit is exsanguinated, the blood being collected in a sterile bowl, covered, and allowed to stand at room temperature for twelve or sixteen hours. The serum is then distributed in small sterile test-tubes, putting about 2 c.c. in each and adding salt solution containing tricresol in small amount so that the concentration of the latter does not exceed 1 : 2000. The tops of the tubes are sealed with a blow-pipe and they are placed on ice. In this way the amboceptor serum may be preserved for three or four months.

Kaplan has pointed out that the preliminary standardization of the amboceptor serum does not suffice to gauge its hæmolytic power under the conditions of the Wassermann reaction, owing to the slight, but appreciable, non-specific inhibiting power of normal blood serum and of whatever antigen may be used. It will, therefore, tend to eliminate error if, on each day when the examination of a series of specimens is undertaken, the amboceptor serum is standardized anew in the presence of a non-syphilitic serum and the usual amount of antigen. This has the further advantage of making possible the allowance for any change that may have taken place in the strength either of the amboceptor or of the antigen.

The standardization is carried out as follows. Six test-tubes about 10 cm. long and 1 cm. in diameter are placed in a rack, and into each are put 0.2 c.c. non-syphilitic serum, the usual quantity of antigen, 0.1 c.c. complement, and 1.0 c.c. 5% sheep corpuscle suspension; the rack is then placed in the incubator for one hour, at the end of which time the

amboceptor serum is added in amounts varying from a concentration of 1 : 200 to one of 1 : 6400, as shown in the following sample titration; the rack is returned to the incubator and the reading taken at the end of two hours.

TABLE 15

Amboceptor serum	1 : 200.......	Complete hæmolysis.
" "	1 : 400.......	" "
" "	1 : 800.......	" "
" "	1 : 1600.......	" "
" "	1 : 3200.......	Slight inhibition.
" "	1 : 6400.......	Marked "

The rule for actual work is to use double the amount of amboceptor which is sufficient to give complete hæmolysis under conditions such as those of the above titration. Accordingly one would select in this case an amount of amboceptor serum to give a concentration of 1 : 800 or 1 : 1000.

Antigen may be prepared in many different ways, and it is immaterial which of these is chosen, the serviceableness of the product depending not so much on the method of preparation as on the care and results of its standardization. The method that seems capable of yielding a most uniform product is that of Noguchi: thoroughly mashed beef liver or kidney is steeped in ten times its volume of absolute alcohol in the incubator for seven days, at the end of which time it is filtered and the filtrate evaporated with the aid of an electric fan to the consistency of a thick, sticky mass; this mass is dissolved in a small quantity of ether, the solution is filtered, and to the filtrate is added five times its volume of acetone; the precipitate which is thrown down immediately is allowed to settle and is taken up after the supernatant fluid has been decanted. 0.2 gram of this precipitate is dissolved in 5 c.c. of ether and to this 100 c.c. of 0.9% salt solution is gradually added; the resulting emulsion is filtered through paper to remove flocculi or solid particles. This emulsion can be kept on ice for weeks without deteriorating, and the stock mass of antigen can be kept even for months under acetone also on ice.

Antigen thus prepared possesses, on the one hand, true *antigenic power*, that is to say, the power of binding complement in the presence of a syphilitic serum and thus inhibiting hæmolysis, and, on the other hand, generally in a lesser degree, an *anti-complementary power*, that is to say, a power of destroying complement and thus inhibiting hæmolysis without the intervention of a syphilitic serum. It must therefore be standardized with a view to determining the proper dosage to be used in the work to insure ample antigenic action and to exclude simple anti-complementary action. For this purpose a titration is carried out in the following manner: twenty small test-tubes are arranged in two rows in a suitable rack; one puts into each test-tube 1 c.c. of sheep corpuscle suspension and 0.1 c.c. of complement, prepared as described above; to each of the tubes in the *front* row one adds also 0.2 c.c. of serum from a syphilitic subject, known to give a positive reaction; one adds finally to the test tubes in both rows the antigen emulsion in amounts varying from 0.03 c.c. in the first test-tube to 1.0 c.c. in the tenth, as shown in the following sample titration. The rack is then placed in the incubator for one hour,

TABLE 16

Amount of Antigen Emulsion.	Front row of tubes: inhibition of hæmolysis due to true antigenic action.	Back row of tubes: inhibition of hæmolysis due to simple anti-complementary action.
0.03 c.c.	Complete hæmolysis	Complete hæmolysis
0.05 c.c.	" "	" "
0.07 c.c.	Partial inhibition	" "
0.10 c.c.	Complete inhibition	" "
0.12 c.c.	" "	" "
0.20 c.c.	" "	" "
0.25 c.c.	" "	" "
0.50 c.c.	" "	Partial inhibition
0.75 c.c.	" "	Complete inhibition
1.00 c.c.	" "	" "

at the end of which time two units of amboceptor serum are added to each tube in both rows and the rack is again placed in the incubator; at the end of two hours of the second incubation the reading is taken.

The proper dosage of a specimen of antigen giving on titration results like those represented above would be 0.12 c.c.

It happens sometimes that a specimen of antigen is found on titration to possess either too feeble an antigenic power or too strong an anti-complementary power; in either case it cannot be used and another lot must be prepared.

Collection of Specimens for Examination.—The only equipment required for obtaining a blood specimen is a test-tube, hollow needle about 1½ inches long, gauge 19, with a short piece of rubber tubing attached to it, and a tourniquet consisting simply of a piece of rubber tubing about 16 inches long. The tourniquet is applied well up on the arm tightly enough to impede the venous but not the arterial flow; it is more convenient to take the blood from the left arm. Having selected the largest sized superficial vein just above the bend of the elbow, the thumb of the left hand is placed on the vein partly to fix it and prevent its slipping and partly to guide the point of the needle; the needle then, held in the right hand with the rubber tube projecting into the test-tube which is also held in the right hand being grasped with the little and ring fingers, is thrust into the vein at a point as close as possible to where it is held by the thumb of the left hand; in doing so the needle is held with the bevel of its point upwards; the direction of the thrust is inwards and upwards in the direction of the vein. If the vein has been properly penetrated blood will begin to trickle into the test-tube either immediately or in a second or two. If it seems that the needle has pierced through the vein instead of into it, blood may be started through it by withdrawing it slightly. About 6 or 7 c.c. of blood is allowed to flow into the test-tube, the needle withdrawn, and the puncture protected with a piece of sterile gauze fastened on with a strip of adhesive plaster. It goes without saying that the needle,

test-tube, etc., are sterilized before being used and that the physician's hands and the patient's arm around the site of the puncture are scrubbed properly.

The test-tube containing the blood is stopped with a cotton plug and allowed to stand at room temperature for several hours, at the end of which time the serum may be examined for the reaction or it may be placed in the refrigerator to be examined on the following day.

Specimens of cerebro-spinal fluid are obtained by lumbar puncture, the technique of which has already been described.

Both the blood serum and the cerebro-spinal fluid should be examined if possible either on the same or on the following day after they have been obtained, as even if kept on ice they soon begin to undergo changes consisting most commonly of a development of non-specific anti-complementary power.

Technique of the Reaction.—A whole rackful of specimens may be examined together. It is most convenient to use a test-tube rack with spaces for two rows of test-tubes. Tubes 10 cm. long and 1 cm. in diameter are best for the purpose. For testing each specimen two tubes are used, a front tube for the reaction and a rear tube for control.

All the blood specimens to be examined are first inactivated by being placed for three-quarters of an hour in a thermostat at a temperature not exceeding 56° C. Spinal fluids do not require to be inactivated.

0.2 c.c. of the serum or spinal fluid to be examined is put in a front tube and the same amount in a corresponding rear tube. At the end of the rack two pairs of tubes are reserved respectively for the positive and negative controls: in the positive control tubes serum or cerebro-spinal fluid known to give a positive reaction is used; in the negative control tubes neither serum nor spinal fluid is used. To each tube is now added 0.1 c.c. guinea-pig complement. Finally to each *front* tube is added the proper dose of antigen emulsion as determined by the titration. It is well to dilute the anti-

gen emulsion with 0.9% salt solution so that 1 c.c. of the dilution will contain the proper dose of antigen. Salt solution is now added to all the tubes, front and rear, so as to bring up the amount in each to 2 c.c., and the rack is placed in the incubator. At the end of one hour the rack is taken out and to each tube are added 1 c.c. of 5% sheep corpuscle suspension and the proper amount of anti-sheep hæmolytic amboceptor as determined by the titration. As in the case of the antigen, it is well to dilute the amboceptor with 0.9% salt solution so that 1 c.c. will contain the proper amount of amboceptor. Each test-tube is thoroughly shaken and the rack is returned to the incubator for two hours longer, during which time the tubes are frequently taken out, inspected, and shaken, and at the end of which time the readings are to be taken. The positive and negative control sets are inspected first, and if these are found to be all right the readings in the other tubes are taken and recorded. The rear tubes, containing no antigen, should in every case show complete hæmolysis; if any rear tube shows inhibition of hæmolysis it is probably due to non-specific anti-complementary power in the specimen of serum or cerebro-spinal fluid, as the case may be, and any inhibition of hæmolysis in the front tube in such a case, being attributable to the same cause, is, therefore, inconclusive. If the rear tubes show complete hæmolysis, inhibition of hæmolysis in any front tube indicates a positive reaction, partial hæmolysis indicates a slight or doubtful reaction, and complete hæmolysis indicates a negative reaction.

APPENDIX III

EXAMINATION FOR APHASIA

Cases of organic brain disease with lesions involving the speech areas and therefore presenting symptoms of aphasia require a special method of examination. An outline for guidance in such examinations was prepared by Professor Adolf Meyer some time ago for use in the New York state hospital service. It is here reproduced without essential change.

The examination presupposes a knowledge of the previous educational level of the patient and a complete neurological status, especially accurate tests of hearing, vision, and other senses. Never omit the question whether the patient is right or left handed. Give a general description of the mental condition of the patient and his attitude toward his needs and the surroundings, the extent of attention and spontaneity, his general appreciation of the condition and of the purpose of the examination.

Reaction to words heard: Does the patient understand his own or others' names, simple or complicated words, orders (button the vest, open the mouth, show the tongue, touch your nose, open the window, hold up three fingers)? Can he compose words spelled to him? Does he pay attention? Does he depend upon gestures? How does he react? (By repeating the words; by forming the question; by adequate answers in words or gestures? Or are the reactions inadequate, paraphasic, mere action, irrelevant productions, or gibberish?) Are there circumlocutions? Evasions of

difficult words, or sticking to words? Does the patient pick out and handle correctly objects named?

Reactions to things heard: Does the patient understand such sounds as the mewing of a cat, barking, ticking of watch, jingling of keys (tests being made with his eyes shut)? Is the intonation of question, scolding, etc., understood?

Repetition of words and sentences: Is the meaning understood at once or only after repetition, or not understood notwithstanding repetition? Is there automatic echolalia?

Spontaneous speech: (*a*) Have the patient give an account of the onset of the trouble, of his admission to the hospital, and of his present condition. Note to what extent he volunteers speech, opens or continues conversation, and sum up the defects of speech shown during these and subsequent tests. What is the extent of his vocabulary? If possible secure a stenographic example. (*b*) Reciting the alphabet, days of the week, months of the year, counting from one to twenty, forward and backward, with or without help. (*c*) Calculations. (*d*) Reciting the Lord's prayer, a poem. (*e*) Spelling words, counting words and syllables. (*f*) Foreign languages.

Reaction to things seen: Can the patient name coins, key, ring, knife, button, thread, bottle; wool, cotton, and silk in various colors; a book; geometrical figures; the meaning, forms, and colors of pictures? Does he understand the meaning of movements such as fiddling, shooting, gestures of threat and beckoning? Is the mimic appreciation disturbed (see also intonation)?

Reaction to things smelled: Can the patient notice and name odors and identify them (wintergreen, clove, peppermint), or point to the name on a list, or when mentioned?

Reaction to things tasted: Sugar, salt, quinine, noticed, named, or picked out from a list, or when mentioned?

Rcaction to things felt (with eyes shut): Recognition and naming of objects (right and left hand); writing on the skin (hand and forehead, geometrical figures, numbers, words). Writing movements with the flaccid hand.

Reaction to words seen, reading: (*a*) Printed letters, short and long words, newspaper headings, paragraphs; does the patient spell them, read them in syllables, or as a whole? Does he pronounce correctly and does he understand? (*b*) Abbreviations (W. C. T. U., Y. M. C. A., G. A. R., U. S. A.). (*c*) Written cards (orders, questions); numerals (Arabic, Roman, fractions, multiplication). (*d*) The patient's own writing; name, etc.

Is the sense grasped without speaking what is read, or only from reading it aloud? Does the patient fumble with his hands? Speak without grasping the sense? Are the helps of any use, such as tracing the letter with a pencil or finger, or by extensive movements of the hands and arms? Is there much clinging to previously spoken words? Is there any improvement by repetition and by helping along?

Writing: (*a*) Spontaneous, a letter to a friend with signature, or a statement concerning present condition. Describe the effort. (*b*) Writing from dictation: name, sentences, numerals, abbreviations (Y. M. C. A., etc.). Calculations in writing. (*d*) Copying written or printed words and sentences. Does the patient understand what he copies? Copying unfamiliar characters, such as Greek or Hebrew.

Drawing: Triangle, circle, tree, automobile; copying.

Music: Is singing and playing understood? Can a tone be taken correctly? Can the patient play or sing? Sing a tune with the words? Speak the words without the tune? Can he read notes? Write notes (from memory or copy)?

Mimic and gestures: To what extent understood and used?

Internal language: Is the memory of places and topography motor or visual? Are forms remembered by motion or visually? Can the patient sound words mentally? Remember the faces of friends? Color of things, visually or only by word association? As a rule conclusions must be drawn from the general composure, adaptability, attention; the indications of the number of letters or syllables in a word;

playing with cards, counting out every sixth card, etc. Does the patient reason?

Apraxia: Use of objects, etc.

Analysis of paraphasic symptoms: Is the patient aware of the difficulty? Is he apathetic or indifferent, or making efforts to correct himself, or to substitute?

APPENDIX IV

NORMAL COURSE OF MENTAL DEVELOPMENT

From Birth to Third Year

(From Preyer, Paton, Church and Peterson, and others)

THE study of the early years of infancy resulted long ago in the formulation of outlines showing the normal course of development of the child. The following composite of several such outlines represents the simplest and earliest type of age scale for the measurement of psychophysical status:

1st Week—Sensitive to light, reaction to touch, evidences of audition, sensibility to taste.

2d Week—Notices candle, facial reaction suggesting pleasure.

3d Week—Sheds tears.

4th Week—Smiles and makes vowel sounds.

1st Month—Taste, smell, touch, sight, hearing active. Sleeps two hours at a time, sixteen hours out of twenty-four.

2d Month—Occasional strabismus, recognizes human voice, turns head toward sound, pleased with music and with human faces, laughs at tickling, clasps with four fingers by end of second month, makes first consonants.

3d Month—Cries with joy at sight of mother or father. Eyelids not completely raised when child looks up. Knows sound of watch. Listens with attention.

4th Month—Eye movements perfect. Sees objects move toward eye. Pleased at seeing self in mirror. Opposes thumb to fingers. Head held up permanently. Sits up with support at back. Begins to imitate.

5th Month—Discriminates strangers. Enjoys crumpling and tearing paper, pulling hair, ringing bell. Sleeps ten hours without food. Makes consonants L and K. Seizes and carries objects to mouth.

6th and 7th Months—Raises self to sitting posture. Laughs. Raises and drops arms when pleasure is great. Teeth begin to appear. Astonishment shown by open mouth and eyes. Turns head as sign of refusal.

8th and 9th Month—Stands on feet without support. Claps hands for joy. Afraid of dogs. Turns over when laid face down. Turns head to light when asked where it is. Voice is more modulated. Questions understood before child can speak.

10th to 12th Months—First attempts at walking. Sitting has become a habit. Stands without support. Whispering begins. Pushes chair. Obeys command "Give me your hand."

13th to 15th Months—Says "Papa" and "Mamma" Raises itself by chair. Imitates coughing and swinging of arms. Walks without support. Understands about ten words.

16th to 19th Months—Sleeps ten hours at a time. Associates words with objects. Blows horn, strikes with hand or foot, waters flowers, tries to wash hands, to comb and brush hair, and to execute other imitative movements.

20th to 24th Months—Makes marks with pencil on paper. Executes simple orders with surprising accuracy.

25th to 30th Months—Distinguishes colors, makes sentences of several words, begins to climb and jump and to ask questions.

30th to 40th Months—Goes up stairs without help. Clauses formed. Words distinctly spoken. Influence of dialect appears. Much questioning.

Beyond 40th Month—See standard Intelligence Scales and specific Performance Tests.

APPENDIX V

STANFORD REVISION OF THE BINET-SIMON INTELLIGENCE SCALE [1]

Materials and Equipment.—The following materials and equipment are required:

(1) A set of printed cards consisting of four pictures used in 3-, 7-, and 12-year tests; lines for comparison used in 4-year test; geometrical forms for discrimination, in duplicate, used in 4-year test; printed colors used in 5-year test; printed faces for æsthetic comparison used in 5-year test; pictures with missing parts used in 6-year test; designs for drawing from memory used in 10-year test; code used in "average adult" test; and scoring cards for square, diamond, ball and field, dictation, and designs used in 4-, 7-, 8-, and 10-year tests.[2]

(2) Record booklets, which are necessary not only for the proper and convenient recording of the results of tests, but also because they contain some of the testing equipment: sentences and digit series for repetition used in 3, 4, 6, 7, 9, and all the higher age tests; square used in 4-year test; diamond used in 7-year test; ball field used in 8- and 12-year tests; the correct wording for comprehension tests used at various ages; printed form for 10-year test for reading and

[1] L. M. Terman. *The Measurement of Intelligence.* Boston, 1916.—We acknowledge gratefully our indebtedness to Professor Terman and the publishers of his book, Houghton, Mifflin Company, for permission to abstract and reprint instructions for testing, scoring, etc.

[2] These printed materials are to be had from Houghton, Mifflin Company, Boston, New York, or Chicago. Price 60 cents, postpaid.

report; and all problems, fables, vocabulary, etc., used in tests at various ages.[1]

(3) Weights used in 5- and 9-year tests and the Healy-Fernald construction puzzle used in 10-year alternative test.[2]

(4) The following articles: coins—$1, 50 cents, quarter, dime, nickel, thirteen pennies; large-sized doorkey, not of the Yale type; pocket knife; watch with second hand; scissors; three one-cent and three two-cent stamps mounted in a single row on a blank card of suitable size, in the order given; two shoe strings; ordinary lead pencil, pen and ink, some cards 2 by 3 inches, pad of paper, and a supply of paper sheets, thin but firm, 8½ by 11 inches; a small rectangular pasteboard box.

Experimental Conditions.—The tests should be conducted in a quiet room, located where the noises of the street and other outside distractions cannot enter. Generally speaking, if accurate results are to be secured it is not permissible to have any auditor, besides possibly an assistant to record the responses.

The examiner's first task is to win the confidence of the child and overcome his timidity. In a majority of cases from three to five minutes should be sufficient, but in a few cases somewhat more time is necessary.

Nothing contributes more to a satisfactory *rapport* than praise of the child's efforts. Under no circumstances should the examiner permit himself to show displeasure at a response, however absurd it may be.

The examiner would avoid testing a child who was exhausted either from work or play, or a child who was noticeably sleepy.

Although we should always encourage the child to believe that he can answer correctly, if he will only try, we must

[1] Record booklets are supplied also by Houghton, Mifflin Company, in packages of 25, at $2 per package, postpaid.

[2] These may be purchased of C. H. Stoelting Company, 3037–3047 Carroll Ave., Chicago, Ill. The cost of the weights is $2.50 and of the construction puzzle $1.50.

avoid the common practice of dragging out responses by too much urging and coaxing.

It cannot be too strongly emphasized that unless we follow a standardized procedure the tests lóse their significance. The danger is chiefly that of unintentionally and unconsciously introducing variations which will affect the meaning of the test. One who would use the tests for any serious purpose, therefore, must study the procedure for each and every test until he knows it thoroughly. After that a considerable amount of practice is necessary before one learns to avoid slips. During the early stages of practice it is necessary to refer to the printed instructions frequently in order to check up errors before they have become habitual.

In a few cases the instruction may be repeated, if there is reason to think the child's hearing was at fault or if some extraordinary distraction has occurred. But unless otherwise stated in the directions, the repetition of a question is ordinarily to be avoided. Supplementary explanations are hardly ever permissible.

Range and Order of Testing.—Unless there is reason to suspect mental retardation, it is usually best to begin with the group of tests just below the child's age. However, if there is a failure in the tests of that group, it is necessary to go back and try all the tests of the previous group. In like manner the examination should be carried up the scale until a test group has been found in which all the tests are failed.

If language tests or memory tests are given first, the child is likely to be embarrassed. More suitable to begin with are those which test knowledge or judgment about objective things, such as the pictures, weights, stamps, bow-knots, colors, coins, counting pennies, number of fingers, right and left, time orientation, ball and field, paper-folding, etc.

The tests as arranged in this revision are in the order which it is usually best to follow, but one should not hesi-

tate to depart from the order given when it seems best in a given case to do so.

Scoring and Recording.—Each subdivision of a test should be scored separately, in order that the clinical picture may be as complete as possible. This helps in the final evaluation of the results. It makes much difference, for example, whether success in repeating six digits is earned by repeating all three correctly or only one; or whether the child's lack of success with the absurdities is due to failure on two, three, four, or all of them. Time should be recorded whenever called for in the record blanks.

Whenever possible the entire response should be recorded. If the test results are to be used by any other person than the examiner, this is absolutely essential.

When for any reason it is not feasible to record anything more than score marks, success may be indicated by the sign +, failure by −, and half credit by ½. An exceptionally good response may be indicated by ++, and an exceptionally poor response by −−. If there is a slight doubt about a success or failure the sign ? may be added to the + or −. In general, however, score the response either + or −, avoiding half credit as far as it is possible to do so.

In addition, the examiner will need to take account of the general attitude of the child during the examination. This is provided for in the record blanks under the heading "comments." The comments should describe as fully as possible the conduct and attitude of the child during the examination, with emphasis upon such disturbing factors as fear, timidity, unwillingness to answer, overconfidence, carelessness, lack of attention, etc.

Alternative Tests.—The tests designated as "alternative tests" are not intended for regular use. Inasmuch as they have been standardized and belong in the year group where they are placed, they may be used as substitute tests on certain occasions. Sometimes one of the regular tests is spoiled in giving it, or the requisite material for it may not be at hand. Sometimes there may be reason to suspect that

the subject has become acquainted with some of the tests. In such cases it is a good convenience to have a few substitutes available.

It is necessary, however, to warn against a possible misuse of alternative tests. *It is not permissible to count success in an alternative test as offsetting failure in a regular test.* This would give the subject too much leeway of failure. There are very exceptional cases, however, when it is legitimate to break this rule; namely, when one of the regular tests would be obviously unfair to the subject being tested. In year X, for example, one of the three alternative tests should be substituted for the reading test (X, 4) in case we are testing a subject who has not had the equivalent of at least two years of school work. In year VIII, it would be permissible to substitute the alternative test of naming six coins, instead of the vocabulary test, in the case of a subject who came from a home where English was not spoken.

Mental Age.—As there are six tests in each age group from III to X, each test in this part of the scale counts 2 months toward mental age. There are eight tests in group XII, which, because of the omission of the 11-year group, have a combined value of 24 months, or 3 months each. Similarly, each of the six tests in XIV has a value of 4 months ($24 \div 6 = 4$). The tests of the "average adult" group are given a value of 5 months each, and those of the "superior adult" group a value of 6 months each.

The rule is: (1) Credit the subject with all the tests below the point where the examination begins (remembering that the examination goes back until a year group has been found in which all the tests are passed); and (2) add to this basal credit 2 months for each test passed successfully up to and including year X, 3 months for each test passed in XII, 4 months for each test passed in XIV, 5 months for each success in "average adult," and 6 months for each success in "superior adult."

Intelligence Quotient.—The mental age alone does not tell us what we want to know about a child's intelligence

status. The significance of a given number of years of retardation or acceleration depends upon the age of the child. A 3-year-old child who is retarded one year is ordinarily feeble-minded; a 10-year-old retarded 1 year is only a little below normal. The child who at 3 years of age is retarded 1 year will probably be retarded 2 years at the age of 6, 3 years at the age of 9, and 4 years at the age of 12.

What we want to know, therefore, is the ratio existing between mental age and real age. This is the intelligence quotient, or I Q. To find it we simply divide mental age (expressed in years and months) by real age (also expressed in years and months). The process is easier if we express each age in terms of months alone before dividing.

Native intelligence, in so far as it can be measured by tests now available, appears to improve but little after the age of 15 or 16 years. Accordingly, any person over 16 years of age, however old, is for purposes of calculating I Q considered to be just 16 years old. If a youth of 18 and a man of 60 years both have a mental age of 12 years, the I Q in each case is 12 ÷ 16, or .75.

The significance of various values of the I Q is set forth elsewhere.[1] Here it need only be repeated that 100 I Q means exactly average intelligence; that nearly all who are below 70 or 75 I Q are feeble-minded; and that the child of 125 I Q is about as much above the average as the high grade feeble-minded individual is below the average. For ordinary purposes all who fall between 95 and 105 I Q may be considered as average in intelligence.

Instructions for Year III

1. Pointing to Parts of the Body.—Procedure.—After getting the child's attention, say: "*Show me your nose.*" "*Put your finger on your nose.*" Same with eyes, mouth, and hair.

[1] See Chapter I, Part II, this Manual.

Tact is often necessary to overcome timidity. If two or three repetitions of the instruction fail to bring a response, point to the child's chin or ear and say: "*Is this your nose?*" "*No?*" "*Then where is your nose?*" Sometimes, after one has tried two or three parts of the test without eliciting any response, the child may suddenly release his inhibitions and answer all the questions promptly. In case of persistent refusal to respond it is best not to harass the child for an answer, but to leave the test for a while and return to it later.

Scoring. *Three responses out of four* must be correct.

2. Naming Familiar Objects.—Procedure.—Use a key, a penny, a closed knife, a watch, and an ordinary lead pencil. The key should be the usual large-sized doorkey, not one of the Yale type. The penny should not be too new, for the freshly made, untarnished penny resembles very little the penny usually seen. Any ordinary pocket knife may be used, and it is to be shown unopened. The formula is, "*What is this?*" or, "*Tell me what this is.*"

Scoring.—There must be at least *three correct responses out of five.* A response is not correct unless the object is named. It is not sufficient for the child merely to show that he knows its use.

3. Enumeration of Objects in Pictures.—Procedure.—Use the three pictures designated as "Dutch Home," "River Scene," and "Post-Office." Say, "*Now I am going to show you a pretty picture.*" Then, holding the first one before the child, close enough to permit distinct vision, say: "*Tell me what you see in this picture.*" If there is no response, as sometimes happens, due to embarrassment or timidity, repeat the request in this form: "*Look at the picture and tell me everything you can see in it.*" If there is still no response, say: "*Show me the . . .*" (naming some object in the picture). Only one question of this type, however, is permissible. If the child answers correctly, say: "*That is fine; now tell me everything you see in the picture.*" If the child names one or two things in a picture

and then stops, urge him on by saying, "*And what else?*" Proceed with pictures *b* and *c* in the same manner.

Scoring. The test is passed if the child enumerates as many as *three* objects in *one* picture *spontaneously;* that is, without intervening questions or urging.

4. Giving Sex.—Procedure.—If the subject is a boy, the formula is: "*Are you a little boy or a little girl?*" If a girl, "*Are you a little girl or a little boy?*" This variation in the formula is necessary because of the tendency in young children to repeat mechanically the last word of anything that is said to them. If there is no response, say: "*Are you a little girl?*" (if a boy); or, "*Are you a little boy?*" (if a girl). If the answer to the last question is "no" (or shake of the head), we then say: "*Well, what are you? Are you a little boy or a little girl?*" (or *vice versa*).

Scoring.—The response is satisfactory if it indicates that the child has really made the discrimination, but we must be cautious about accepting any other response than the direct answer, "A little girl," or, "A little boy." "Yes" and "no" in response to the second question must be carefully checked up.

5. Giving the Family Name.—Procedure.—The child is asked, "*What is your name?*" If the answer, as often happens, includes only the first name (Walter, for example), say: "*Yes, but what is your other name? Walter what?*" If the child is silent, or if he only repeats the first name, say: "*Is your name Walter . . ?*" (giving a fictitious name, as Jones, Smith, etc.). This question nearly always brings the correct answer if it is known.

Scoring.—Simply + or −. No attention is paid to faults of pronunciation.

6. Repeating Six to Seven Syllables.—Procedure.—Begin by saying: "*Can you say 'mamma'? Now, say 'nice kitty.'*" Then ask the child to say, "*I have a little dog.*" Speak the sentence distinctly and with expression, but in a natural voice and not too slowly. If there is no response, the first sentence may be repeated two or three times. Then

give the other two sentences: "*The dog runs after the cat,*" and "*In summer the sun is hot.*" A great deal of tact is sometimes necessary to enlist the child's coöperation in this test. If he cannot be persuaded to try, the alternative test of three digits may be substituted.

Scoring.—The test is passed if at least *one sentence is repeated without error after a single reading.* "Without error" is to be taken literally; there must be no omission, insertion, or transposition of words. Ignore indistinctness of articulation and defects of pronunciation as long as they do not mutilate the sentence beyond easy recognition.

Alternative Test: Repeating Three Digits.—Procedure.—Use the following digits: 6–4–1, 3–5–2, 8–3–7. Begin with two digits, as follows: "*Listen; say* 4–2." "*Now, say* 6–4–1." "*Now, say* 3–5–2," etc. Pronounce the digits in a distinct voice and with perfectly uniform emphasis at a rate just a little faster than one per second. Two per second, as recommended by Binet, is too rapid.

Young subjects, because of their natural timidity in the presence of strangers, sometimes refuse to respond to this test. With subjects under five or six years of age it is sometimes necessary in such cases to re-read the first series of digits several times in order to secure a response. The response thus secured, however, is not counted in scoring, the purpose of the re-reading being merely to break the child's silence. The second and third series may be read but once.

Scoring.—Passed if the child repeats correctly, *after a single reading, one series out of the three* series given. Not only must the correct digits be given, but the order also must be correct.

Instructions for Year IV

1. Comparison of Lines.—Procedure.—Present the appropriate accompanying card with the lines in horizontal position. Point to the lines and say: "*See these lines.*

Look closely and tell me which one is longer. Put your finger on the longest one." We use the superlative as well as the comparative form of *long* because it is often more familiar to young subjeets. If the child does not respond, say: "*Show me which line is the biggest.*" Then withdraw the card, turn it about a few times, and present it again with the position of the two lines reversed, saying: "*Now show me the longest.*" Turn the eard again and make a third presentation.

Scoring.—All three comparisons must be made eorrectly; or if only two responses out of three are eorrect, all three pairs are again shown, just as before, and if there is no error this time, the test is passed. The standard, therefore, is *three correct responses out of three, or five out of six.*

Sometimes the child points, but at no partieular part of the card. In such eases it may be diffieult to decide whether he has failed to comprehend and to make the discrimination or has only been careless in pointing. It is then necessary to repeat the experiment until the evidenee is elear.

2. Discrimination of Forms.—Procedure.—First, plaee the eircle of the duplicate set at "×," and say: "*Show me one like this,*" at the same time passing the finger around the circumferenee of the cirele. If the child does not respond, say: "*Do you see all of these things?*" (running the finger over the various forms); "*And do you see this one?*" (pointing again to the circle); "*Now find me another one just like this.*" Use the square next, then the triangle, and the others in any order.

Correct the ehild's first error by saying: "*No, find one just like this*" (again passing the finger around the outline of the form at "×"). Make no eomment on errors after the first one, proceeding at once with the next form, but eaeh time the choice is correct encourage the child with a hearty "That's good," or something similar.

Scoring.—The test is passed if *seven out of ten* ehoiees are eorreet, the first eorreeted error being eounted.

3. Counting Four Pennies.—Procedure.—Place four pennies in a horizontal row before the child. Say: "*See these pennies. Count them and tell me how many there are. Count them with your finger, this way*" (pointing to the first one on the child's left)—"*One*"—"*Now, go ahead.*" If the child simply gives the number (whether right or wrong) without pointing, say: "*No; count them with your finger, this way,*" starting him off as before. Have him count them aloud.

Scoring.—The test is passed only if the counting tallies with the pointing. It is not sufficient merely to state the correct number without pointing.

4. Copying a Square.—Procedure.—Place before the child a cardboard on which is drawn in heavy black lines a square about 1¼ inches on a side. Give the child a pencil and say: "*You see that* (pointing to the square). *I want you to make one just like it. Make it right here* (showing where it is to be drawn). *Go ahead. I know you can do it nicely.*"

Avoid such an expression as, "*I want you to draw a figure like that.*" The child may not know the meaning of either *draw* or *figure*. Also, in pointing to the model, take care not to run the finger around the four sides.

Give three trials, saying each time: "*Make it exactly like this,*" pointing to model. Make sure that the child is in an easy position and that the paper used is held so it cannot slip.

Scoring.—The test is passed if at least *one drawing out of the three* is as good as those marked + on the score card. Young subjects usually reduce figures in drawing from copy. but size is wholly disregarded in scoring. It is of more importance that the right angles be fairly well preserved than that the lines should be straight or the corners entirely closed. The scoring of this test should be rather liberal.

5. Comprehension, First Degree.—Procedure.—After getting the child's attention, say: "*What must you do when you are sleepy?*" If necessary the question may be repeated a number of times, using a persuasive and encouraging tone of voice. No other form of question may be substituted.

About twenty seconds may be allowed for an answer, though as a rule subjects of four or five years usually answer quite promptly or not at all.

Proceed in the same way with the other two questions: "*What ought you to do when you are cold?*" "*What ought you to do when you are hungry?*"

Scoring.—There must be *two correct responses out of three.* No one form of answer is required. It is sufficient if the question is comprehended and given a reasonably sensible answer. The following are samples of correct responses:—(*a*) "Go to bed." "Go to sleep." "Have my mother get me ready for bed." "Lie still, not talk, and I'll soon be asleep." (*b*) "Put on a coat" (or "cloak," "furs," "wrap up," etc.). "Build a fire." "Run and I'll soon get warm." "Get close to the stove." "Go into the house," or, "Go to bed," may possibly deserve the score *plus*, though they are somewhat doubtful and are certainly inferior to the responses just given. (*c*) "Eat something." "Drink some milk." "Buy a lunch." "Have my mamma spread some bread and butter," etc.

6. Repeating Four Digits.—Procedure.—Say: "*Now, listen. I am going to say over some numbers and after I am through, I want you to say them exactly like I do. Listen closely and get them just right*—4–7–3–9." Same with 2–8–5–4 and 7–2–6–1. The examiner should consume nearly four seconds in pronouncing each series, and should practice in advance until this speed can be closely approximated. If the child refuses to respond, the first series may be repeated as often as may be necessary to prove an attempt, but *success with a series which has been re-read may not be counted.* The second and third series may be pronounced but once.

Scoring.—Passed if the child repeats correctly, *after a single reading, one series out of the three* series given. The order must be correct.

Alternative Test: Repeating Twelve to Thirteen Syllables.—Procedure.—Get the child's attention and say:

"*Listen, say this: 'Where is kitty?'*" After the child responds, add: "*Now say this . . .* ," reading the first sentence in a natural voice, distinctly and with expression. If the child is too timid to respond, the first sentence may be re-read, but in this case the response is not counted. *Re-reading is permissible only with the first sentence.*

Scoring.—The test is passed if at least *one sentence is repeated without error after a single reading.* As in the alternative test of year III, we ignore ordinary indistinctness and defects of pronunciation due to imperfect language development, but the sentence must be repeated without addition, omission, or transposition of words.

Instructions for Year V

1. Comparison of Weights.—Procedure.—Place the 3- and 15-gram weights on the table before the child some 2 or 3 inches apart. Say: "*You see these blocks. They look just alike, but one of them is heavy and one is light. Try them and tell me which one is heavier.*" If the child does not respond, repeat the instructions, saying this time, "*Tell me which one is the heaviest.*" (Many American children have heard only the superlative form of the adjective used in the comparison of two objects.)

Sometimes the child merely points to one of the blocks or picks up one at random and hands it to the examiner thinking he is asked to *guess* which is heaviest. We then say: "*No, that is not the way. You must take the blocks in your hands and try them, like this*" (illustrating by lifting with one hand, first one block, then the other, a few inches from the table). Most children of five years are then able to make the comparison correctly. Very young subjects, however, or older ones who are retarded, sometimes adopt the rather questionable method of lifting both weights in the same hand at once. This is always an unfavorable sign, especially if one of the blocks is placed in the hand on top of the other block.

After the first trial, the weights are shuffled and again presented for comparison as before, *this time with the positions reversed.* The third trial follows with the blocks in the same position as in the first trial. Some children have a tendency to stereotyped behavior, which in this test shows itself by choosing always the block on a certain side. Hence the necessity of alternating the positions. Reserve commendation until all three trials have been given.

Scoring.—The test is passed if *two of the three* comparisons are correct. If there is reason to suspect that the successful responses were due to lucky guesses, the test should be entirely repeated.

2. Naming Colors.—Procedure.—Point to the colors in the order, red, yellow, blue, green. Bring the finger close to the color designated, in order that there may be no mistake as to which one is meant, and say: "*What is the name of that color?*" Do not say: "*What color is that?*" or, "*What kind of a color is that?*" Such a formula might bring the answer, "The first color"; or, "A pretty color." Still less would it do to say: "*Show me the red,*" "*Show me the yellow,*" etc. This would make it an entirely different test, one that would probably be passed a year earlier than the Binet form of the experiment. Nor is it permissible, after a color has been miscalled, to return to it and again ask its name.

Scoring.—The test is passed only if *all* the colors are named correctly and without marked uncertainty. However, prefixing the adjective "dark," or "light," before the name of a color is overlooked.

3. Æsthetic Comparison.—Procedure.—Show the pairs in order from top to bottom. Say: "*Which of these two pictures is the prettiest?*" Use both the comparative and the superlative forms of the adjective. Do not use the question, "Which face is the uglier (ugliest)?" unless there is some difficulty in getting the child to respond. It is not permitted, in case of an incorrect response, to give that part of the test again and to allow the child a chance to correct

his answer; or, in case this is done, we must consider only the original response in scoring.

Scoring.—The test is passed only if all *three* comparisons are made correctly. Any marked uncertainty is failure. Sometimes the child laughingly designates the ugly picture as the prettier, yet shows by his amused expression that he is probably conscious of its peculiarity or absurdity. In such cases "pretty" seems to be given the meaning of "funny" or "amusing." Nevertheless, we score this response as failure, since it betokens a rather infantile tolerance of ugliness.

4. Giving Definitions in Terms of Use.—Procedure.—Use the words: *Chair, horse, fork, doll, pencil,* and *table.* Say: "*You have seen a chair. You know what a chair is. Tell me, what is a chair?*" And so on with the other words, always in the order in which they are named above.

Occasionally there is difficulty in getting a response, which is sometimes due merely to the child's unwillingness to express his thoughts in sentences. The earlier tests require only words and phrases. In other cases silence is due to the rather indefinite form of the question. The child could answer, but is not quite sure what is expected of him. Whatever the cause, a little tactful urging is nearly always sufficient to bring a response.

The urging should take the following form: "*I'm sure you know what a . . . is. You have seen a . . . Now, tell me, what is a . . . ?*" That is, we merely repeat the question with a word of encouragement and in a coaxing tone of voice. It would not at all do to introduce other questions, like, "*What does a . . . look like?*" or, "*What is a . . . for?*" "*What do people do with a . . . ?*"

Sometimes, instead of attempting a definition (of *doll,* for example), the child begins to talk in a more or less irrelevant way, as, "I have a great big doll. Auntie gave it to me for Christmas," etc. In such cases we repeat the question, saying: "*Yes, but tell me; what is a doll?*"

Scoring.—The test is passed in year V if *four words out of the six* are defined in terms of use (or better than use).

The following are examples of satisfactory responses:— *Chair:* "To sit on." "You sit on it." "It is made of wood and has legs and back," etc. *Horse:* "To drive." "To ride." "What people drive." "To pull the wagon." "It is big and has four legs," etc. *Fork:* "To eat with." "To stick meat with." "It is hard and has three sharp things," etc. *Doll:* "To play with." "What you dress and put to bed." "To rock," etc. *Pencil:* "To write with." "To draw." "They write with it." "It is sharp and makes a black mark." *Table:* "To eat on." "What you put the dinner on." "Where you write." "It is made of wood and has legs." Examples of failure are such responses as the following: "A chair is a chair"; "There is a chair"; or simply, "There" (pointing to a chair). We record such responses without pressing for a further definition. About the only other type of failure is silence.

5. The Game of Patience.—Material.—Prepare two rectangular cards, each 2×3 inches, and divide one of them into two triangles by cutting it along one of its diagonals.

Procedure.—Place the uncut card on the table with one of its longer sides to the child. By the side of this card, a little nearer the child and a few inches apart, lay the two halves of the divided rectangle with their hypothenuses turned from each other as follows:

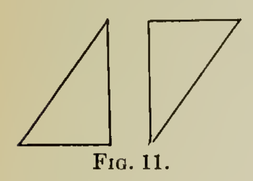


Fig. 11.

Then say to the child: "*I want you to take these two pieces* (touching the two triangles) *and put them together so they will look exactly like this*" (pointing to the uncut card). If the child hesitates, we repeat the instructions with a little urging. Say nothing about hurrying, as this is likely to cause confusion. Give three trials, of one minute each. If only one trial is given, success is too often a result of chance moves; but luck is not likely to bring two successes in three trials. If the first trial is a failure, move the cut halves back to their original position and say: "*No: put them together so they will look like this*" (pointing to the

uncut card). Make no other comment of approval or disapproval. Disregard in silence the inquiring looks of the child who tries to read his success or failure in your face.

If one of the pieces is turned over, the task becomes impossible, and it is then necessary to turn the piece back to its original position and begin over, not counting this trial. Have the under side of the pieces marked so as to avoid the risk of presenting one of them to the child wrong side up.

Scoring.—There must be *two successes in three trials.* About the only difficulty in scoring is that of deciding what constitutes a trial. We count it a trial when the child brings the pieces together and (after a few or many changes) leaves them in some position. Whether he succeeds after many moves, or leaves the pieces with approval in some absurd position, or gives up and says he cannot do it, his effort counts as one trial. A single trial may involve a number of unsuccessful changes of position in the two cards, but these changes may not consume altogether more than one minute.

6. Three Commissions.—Procedure.—After getting up from the chair and moving with the child to the center of the room, say: *"Now, I want you to do something for me. Here's a key. I want you to put it on that chair over there; then I want you to shut* (*or open*) *that door, and then bring me the box which you see over there* (pointing in turn to the objects designated). *Do you understand? Be sure to get it right. First, put the key on the chair, then shut* (open) *the door, then bring me the box* (again pointing). *Go ahead."* Stress the words *first* and *then* so as to emphasize the order in which the commissions are to be executed.

Give the commissions always in the above order. Do not repeat the instructions again or give any further aid whatever, even by the direction of the gaze. If the child stops or hesitates it is never permissible to say: *"What next?"* Have the self-control to leave the child alone with his task.

Scoring.—*All three commissions must be executed and in the proper order.* Failure may result, therefore, either from leaving out one or more of the commands or from changing the order. The former is more often the case.

Alternative Test: Giving Age.—Procedure.—The formula is simply, "*How old are you?*" The child of this age is, of course, not expected to know the date of his birthday, but merely how many years old he is.

Scoring.—About the only danger in scoring is in the failure to verify the child's response. Some children give an incorrect answer with perfect assurance, and it is therefore always necessary to verify.

Instructions for Year VI

1. Distinguishing Right and Left.—Procedure.—Say to the child: "*Show me your right hand.*" After this is responded to, say: "*Show me your left ear.*" Then: "*Show me your right eye.*" Stress the words *left* and *ear* rather strongly and equally; also *right* and *eye.* If there is one error, repeat the test, this time with left hand, right ear, and left eye. Carefully avoid giving any help by look of approval or disapproval, by glancing at the part of the body indicated, or by supplementary questions.

Scoring.—The test is passed if all three questions are answered correctly, or if, in case of one error, the three additional questions are all answered correctly. The standard, therefore, *is three out of three, or five out of six.*

The chief danger of variation among different examiners in scoring comes from double responses. For example, the child may point first to one ear and then to the other. In all cases of double response, the rule is to count the second response and disregard the first. This holds whether the first response was wrong and the second right, or *vice versa.*

2. Finding Omissions in Pictures.—Procedure.—Show the pictures to the child one at a time in the order in which

they are lettered, *a*, *b*, *c*, *d*. When the first picture is shown (that with the eye lacking), say: "*There is something wrong with this face. It is not all there. Part of it is left out. Look carefully and tell me what part of the face is not there.*" Often the child gives an irrelevant answer, as, "The feet are gone," "The stomach is not there," etc. These statements are true, but they do not satisfy the requirements of the test, so we say: "*No; I am talking about the face. Look again and tell me what is left out of the face.*" If the correct response does not follow, we point to the place where the eye should be and say: "*See, the eye is gone.*" When picture *b* is shown we say merely: "*What is left out of this face?*" Likewise with picture *c*. For picture *d* we say: "*What is left out of this picture?*" No help of any kind is given unless (if necessary) with the first picture. With the others we confine ourselves to the single question, and the answer should be given promptly, say within twenty to twenty-five seconds.

Scoring.—Passed if the omission is correctly pointed out in *three out of four* of the pictures. Certain minor errors we may overlook, such as "eyes" instead of "eye" for the first picture; "nose and one ear" instead of merely "nose" for the third; "hands" instead of "arms" for the fourth, etc. Errors like the following, however, count as failure: "The other eye," or "The other ear" for the first or third; "The ears" for the fourth, etc.

3. Counting Thirteen Pennies.—Procedure.—The procedure is the same as in the test of counting four pennies (year IV, test 3). If the first response contains only a minor error, such as the omission of a number in counting, failure to tally with the finger, etc., a second trial is given.

Scoring.—The test is passed if there is *one success in two trials*. Success requires that the counting should tally with the pointing. It is not sufficient merely to state the number of pennies without pointing, for unless the child points and counts aloud we cannot be sure that his correct answer may not be the joint result of two errors in opposite direc-

tions and equal; for example, if one penny were skipped and another were counted twice the total result would still be correct, but the performance would not satisfy the requirements.

4. Comprehension, Second Degree.—Procedure.—Note that the wording of the first part of the questions is slightly different from that in year IV, test 5.

If there is no response, or if the child looks puzzled, the question may be repeated once or twice. The form of the question must not under any circumstances be altered.

Scoring.—*Two out of three* must be answered correctly.

(*a*) *If it is raining when you start to school. Satisfactory:*—"Take umbrella," "Bring a parasol," "Put on rubbers," "Wear an overcoat," etc. This type of response occurred 61 times out of 72 successes. "Have my father bring me" also counts *plus*.

Unsatisfactory:—"Go home," "Stay at home," "Stay in the house," "Have the rainbow," "Stay in school," etc. "Stay at home" is the most common failure and might at first seem to the examiner to be a satisfactory response. As a matter of fact, this answer rests on a slight misunderstanding of the question, the import of which is that one is to go to school and it is raining.

(*b*) *If you find that your house is on fire. Satisfactory:*—"Ring the fire alarm," "Call the firemen," "Call for help," "Put water on it," etc.

Unsatisfactory:—The most common failure, accounting for nearly half of all, is to suggest finding other shelter; e.g., "Go to the hotel," "Get another house," "Stay with your friends," "Build a new house," etc. Others are: "Tell them you are sorry it burned down," "Be careful and not let it burn again," "Have it insured," "Cry," "Call the policeman," etc.

(*c*) *If you miss your train. Satisfactory:*—The answer we expect is, "Wait for another," "Take the next car," or something to that effect. This type of answer includes about 85% of the responses which do not belong obviously

in the unsatisfactory group. "Take a jitney" is a modern variation of this response which must be counted as satisfactory.

Unsatisfactory:—These are endless. One continues to meet new examples of absurdity however many children one has tested. The possibilities are literally inexhaustible, but the following are among the most common: "Wait for it to come back," "Have to walk," "Be mad," "Don't swear," "Run and try to catch it," "Try to jump on," "Don't go to that place." "Go to the next station," etc.

5. Naming Four Coins.—Procedure.—Show a nickel, a penny, a quarter, and a dime, asking each time: "*What is that?*" If the child misunderstands and answers, "Money," or "A piece of money," we say: "*Yes, but what do you call that piece of money?*" Show the coins always in the order given above.

Scoring.—The test is passed if *three of the four* questions are correctly answered. Any correct designation of a coin is satisfactory, including provincialisms like "two bits" for the 25-cent piece, etc. If the child changes his response for a coin, we count the second answer and ignore the first. No supplementary questions are permissible.

6. Repeating Sixteen to Eighteen Syllables.—Procedure.—The instructions should be given as follows: "*Now, listen. I am going to say something and after I am through I want you to say it over just like I do. Understand? Listen carefully and be sure to say exactly what I say.*" Then read the first sentence rather slowly, in a distinct voice, and with expression. If the response is not too bad, praise the child's efforts. Then proceed with the second and third sentences, prefacing each with an exhortation to "say exactly what I say."

In this year and in the memory-for-sentences tests of later years it is not permissible to re-read even the first sentence.

Scoring.—The test is passed *if at least one sentence out of three is repeated without error, or if two are repeated with*

not more than one error each. A single omission, insertion, or transposition counts as an error. Faults of pronunciation are of course overlooked. It is not sufficient that the thought be reproduced intact; the exact language must be repeated.

Alternative Test: Forenoon and Afternoon.—Procedure.—If it is morning, ask: "*Is it morning or afternoon?*" If it is afternoon, put the question in the reverse form, "*Is it afternoon or morning?*"

Scoring.—The test is passed if the correct response is given with apparent assurance. If the child says he is not sure but *thinks* it is forenoon (or afternoon, as the case may be), we score the response a failure even if the answer happens to be correct. However, this type of response is not often encountered.

INSTRUCTIONS FOR YEAR VII

1. Giving the Number of Fingers.—Procedure.—"*How many fingers have you on one hand?*" "*How many on the other hand?*" "*How many on both hands together?*" If the child begins to count in response to any of the questions, say: "*No, don't count. Tell me without counting.*" Then repeat the question.

Scoring.—Passed *if all three questions are answered correctly and promptly* without the necessity of counting. Some subjects do not understand the question to include the thumbs. We disregard this if the number of fingers exclusive of thumbs is given correctly.

2. Description of Pictures.—Procedure.—Use the same pictures as in III, 3, presenting them always in the following order: Dutch Home, River Scene, Post-Office. The formula for the test in this year is somewhat different from that of year III. Say: "*What is this picture about? What is this a picture of?*" Use the double question, and follow the formula exactly. It would ruin the test to say: "*Tell me everything you see in this picture,*" for this form of question

tends to provoke the enumeration response even with intelligent children of this age.

When there is no response, the question may be repeated as often as is necessary to break the silence.

Scoring.—The test is passed if *two of the three* pictures are described or interpreted. Interpretation, however, is seldom encountered at this age. Often the response consists of a mixture of enumeration and description. The rule is that the reaction to a picture should not be scored *plus* unless it is made up chiefly of description (or interpretation).

Picture (*a*). *Satisfactory responses:*—"The little girl is crying. The mother is looking at her and there is a little kitten on the floor."

"The mother is watching the baby, and the cat is looking at a hole in the floor, and there is a lamp and a table so I guess it's a dining room."

Picture (*b*). *Satisfactory responses:*—"Some people in a boat. The water is high and if they don't look out the boat will tip over."

"Some Indians and a lady and man. They are in a boat on the river and the boat is about to upset, and there are some dead trees going to fall."

Picture (*c*). *Satisfactory responses:*—"A man selling eggs and two men reading the paper together and two men watching."

"A few men reading a newspaper and one has a basket of eggs and this one has been fishing."

Unsatisfactory responses are those made up entirely or mainly of enumeration. A phrase or two of description intermingled with a larger amount of enumeration counts *minus*. Sometimes the description is satisfactory as far as it goes, but is exceedingly brief. In such cases a little tactful urging ("*Go ahead*," etc.) will extend the response sufficiently to reveal its true character.

3. Repeating Five Digits.—**Procedure.**—Use: 3–1–7–5–9; 4–2–3–8–5; 9–8–1–7–6. Tell the child to listen and to say after you just what you say. Then read the first series of

digits at a slightly faster rate than one per second, in a distinct voice, and with perfectly uniform emphasis. *Avoid rhythm.*

In previous tests with digits, it was permissible to re-read the first series if the child refused to respond. In this year, and in the digits tests of later years, this is not permissible. Warning is not given as to the number of digits to be repeated. Before reading each series, get the child's attention. Do not stare at the child during the response, as this is disconcerting. Look aside or at the record sheet.

Scoring.—Passed if the child repeats correctly, after a single reading, *one series out of the three* series given. The order must be correct.

4. Tying a Bow-knot.—Procedure.—Prepare a shoestring tied in a bow-knot around a stick. The knot should be an ordinary " double bow," with wings not over 3 or 4 inches long. Make this ready in advance of the experiment and show the child only the completed knot.

Place the model before the subject with the wings pointing to the right and left, and say: "*You know what kind of knot this is, don't you? It is a bow-knot. I want you to take this other piece of string and tie the same kind of knot around my finger.*" At the same time give the child a piece of shoestring, of the same length as that which is tied around the stick, and hold out a finger pointed toward the child and in convenient position for the operation. It is better to have the subject tie the string around the examiner's finger than around a pencil or other object because the latter often falls out of the string and is otherwise awkward to handle.

Some children who assert that they do not know how to tie a bow-knot are sometimes nevertheless successful when urged to try. It is always necessary, therefore, to secure an actual trial.

Scoring.—The test is passed if a double bow-knot (both ends folded in) is made *in not more than a minute.* A single

bow-knot (only one end folded in) counts half credit, because children are often accustomed to use the single bow altogether. The usual plain common knot, which precedes the bow-knot proper, must not be omitted if the response is to count as satisfactory, for without this preliminary plain knot a bow-knot will not hold and is of no value. To be satisfactory the knot should also be drawn up reasonably close, not left gaping.

5. Giving Differences from Memory.—Procedure.—Say: "*What is the difference between a fly and a butterfly?*" If the child does not seem to understand, say: "*You know flies, do you not? You have seen flies? And you know the butterflies! Now, tell me the difference between a fly and a butterfly.*" Proceed in the same way with *stone and egg*, and *wood and glass*. A little coaxing is sometimes necessary to secure a response, but supplementary questions and suggestions of every kind are to be avoided. For example, it would not be permissible for the examiner to say: "*Which is larger, a fly or a butterfly?*" This would give the child his cue and he would immediately answer, "A butterfly." The child must be left to find a difference by himself. Sometimes a difference is given, but without any indication as to its direction, as, for example, "One is bigger than the other" (for fly and butterfly). It is then permissible to ask: "*Which is bigger?*"

Scoring.—Passed if a real difference is given in *two out of three comparisons*. It is not necessary, however, that an *essential* difference be given; the difference may be trivial, only it must be a real one. The following are samples of satisfactory and unsatisfactory responses:

Fly and butterfly. Satisfactory:—"Butterfly is larger." "Butterfly has bigger wings." "Fly is black and a butterfly is not."

Unsatisfactory:—These are mostly misstatements of facts; as: "Fly is bigger." "Fly has legs and butterfly hasn't." "Butterfly has no feet and fly has." "Butterfly makes butter."

Stone and egg. *Satisfactory:*—" Stone is harder." " Egg is softer." " Egg breaks easier." " Egg breaks and stone doesn't." " Stone is heavier."

Unsatisfactory:—" A stone is bigger (or smaller) than an egg." " A stone is square and an egg is round." " An egg is yellow and a stone is white."

Wood and glass. *Satisfactory:*—" Glass breaks easier than wood." " Glass breaks and wood does not." " Wood is stronger than glass." " Glass you can see through and wood you can't."

Unsatisfactory:—" Wood is black and glass is white." (Color differences are always unsatisfactory in this comparison unless transparency is also mentioned.) " Glass is square and wood is round." " Glass is bigger than wood."

6. Copying a Diamond.—Procedure.—Place the model before the child with the longer diagonal pointing directly toward him, and giving him *pen and ink* and paper, say: " *I want you to draw one exactly like this.*" Give three trials, saying each time: " *Make it exactly like this one.*" In repeating the above formula, merely point to the model; do not pass the fingers around its edge.

Scoring.—The test is passed if *two of the three* drawings are at least as good as those marked satisfactory on the score card. The diamond should be drawn approximately in the correct position, and the diagonals must not be reversed. Disregard departures from the model with respect to size.

Alternative Test 1: Naming the Days of the Week.—Procedure.—Say: " *You know the days of the week, do you not? Name the days of the week for me.*" Sometimes the child begins by naming various annual holidays, as Christmas, Fourth of July, etc. Perhaps he has not comprehended the task; at any rate, we give him one more trial by stopping him and saying: " *No; that is not what I mean. I want you to name the days of the week.*" No supplementary questions are permissible, and we must be careful not to

show approval or disapproval in our looks as the child is giving his response.

If the days have been named in correct order, we check up the response to see whether the real order of days is known or whether the names have only been repeated mechanically. This is done by asking the following questions: "*What day comes before Tuesday?*" "*What day comes before Thursday?*" "*What day comes before Friday?*"

Scoring.—The test is passed if, within *fifteen seconds*, the days of the week are *all named in correct order*, and if the child succeeds in at least *two of the three check questions.* We disregard the point of beginning.

Alternative Test 2: Repeating Three Digits Reversed.—Procedure.—The digits used are: 2–8–3; 4–2–7; 5–9–6. The test should be given after, but not immediately after, the tests of repeating digits forwards.

Say to the child: "*Listen carefully, I am going to read some numbers again, but this time I want you to say them backwards. For example, if I should say* 1–2–3, *you would say* 3–2–1. *Do you understand?*" When it is evident that the child has grasped the instructions, say: "*Ready now; listen carefully, and be sure to say the numbers backwards.*" Then read the series at the same rate and in the same manner as in the other digits tests. It is not permissible to re-read any of the series.

If the first series is repeated forwards instead of backwards, the instructions must be repeated. Before each series exhort the child to listen carefully and to be sure to repeat the numbers backwards.

Scoring.—The test is passed if *one series out of three* is repeated backwards without error.

Instructions for Year VIII

1. The Ball-and-field Test.—Procedure.—Say: "*Let us suppose that your baseball has been lost in this round field. You have no idea what part of the field it is in. You don't know what direction it came from, how it got there, or with*

what force it came. All you know is that the ball is lost somewhere in the field. Now, take this pencil and mark out a path to show me how you would hunt for the ball so as to be sure not to miss it. Begin at the gate and show me what path you would take."

Give the instructions always as worded above. Avoid using an expression like, "*Show me how you would walk around in the field*": the word *around* might suggest a circular path.

Sometimes the child merely points or tells how he would go. It is then necessary to say: "*No; you must mark out your path with the pencil so I can see it plainly.*" Other children trace a path only a little way and stop, saying: "Here it is." We then say: "*But suppose you have not found it yet. Which direction would you go next?*" In this way the child must be kept tracing a path until it is evident whether any plan governs his procedure.

Scoring.—The performances secured with this test are conveniently classified into four groups, representing progressively higher types. The first two types represent failures; the third is satisfactory at year VIII, the fourth at year XII. They may be described as follows:

Type a (failure). The child fails to comprehend the instructions and either does nothing at all or else, perhaps, takes the pencil and makes a few random strokes which could not be said to constitute a search.

Type b (also failure). The child comprehends the instructions and carries out a search, but without any definite plan. Absence of plan is evidenced by the crossing and re-crossing of paths, or by "breaks." A break means that the pencil is lifted up and set down in another part of the field. Sometimes only two or three fragments of paths are drawn, but more usually the field is pretty well filled up with random meanderings which cross each other again and again. Other illustrations of type *b* are: A single straight or curved line going direct to the ball, short haphazard dashes or curves, bare suggestions of a fan or spiral.

Type c (satisfactory at year VIII). A successful performance at year VIII is characterized by the presence of a plan, but one ill-adapted to the purpose. That some forethought is exercised is evidenced, (1) by fewer crossings, (2) by a tendency either to make the lines more or less parallel or else to give them some kind of symmetry, and (3) by fewer breaks. The possibilities of type *c* are almost unlimited, and one is continually meeting new forms. We have distinguished more than twenty of these, the most common of which may be described as follows:

1. Very rough or zigzag circles or similarly imperfect spirals. 2. Segments of curves joined in a more or less symmetrical fashion. 3. Lines going back and forth across the field, jointed at the ends and not intended to be parallel. 4. The "wheel plan," showing lines radiating from near the center of the field toward the circumference. 5. The "fan plan," showing a number of lines radiating (usually) from the gate and spreading out over the field. 6. "Fan ellipses" or "fan spirals" radiating from the gate like the lines just described. 7. "The leaf plan," "rib plan," or "tree plan," with lines branching off from a trunk line like ribs, veins of a leaf, or branches of a tree. 8. Parallel lines which cross at right angles and mark off the field like a checkerboard. 9. Paths making one or more fairly symmetrical geometrical figures, like a square, a diamond, a star, a hexagon, etc. 10. A combination of two or more of the above plans.

Type d (satisfactory at year XII). Performances of this type meet perfectly, or almost perfectly, the logical requirements of the problem. The paths are almost or quite parallel, and there are no intersections or breaks. The possibilities of type *d* are fewer and embrace chiefly the following:—1. A spiral, perfect or almost perfect, and beginning either at the gate or at the center of the field. 2. Concentric circles. 3. Transverse lines parallel or almost so, and joined at the ends.

Grading presents some difficulties because of occasional border-line performances which have a value almost mid-

way between types *b* and *c* or between *c* and *d*. Frequent reference to the scoring card will enable the examiner, after a little experience, to score nearly all the doubtful performances satisfactorily.

2. Counting Backwards from 20 to 1.—Procedure.— Say to the child: "*You can count backwards, can you not? I want you to count backwards for me from* 20 *to* 1. *Go ahead.*" In the great majority of cases this is sufficient; the child comprehends the task and begins. If he does not comprehend and is silent, or starts in, perhaps, to count forwards from 1 or 20, say: "*No; I want you to count backwards from* 20 to 1, *like this:* 20–19–18, *and clear on down to* 1. *Now, go ahead.*"

Insist upon the child trying it even though he asserts he cannot do it. In many such cases an effort is crowned with success. Say nothing about hurrying, as this confuses some subjects. Prompting is not permissible.

Scoring.—The test is passed if the child counts from 20 to 1 *in not over forty seconds and with not more than a single error* (one omission or one transposition). Errors which the child spontaneously corrects are not counted as errors.

3. Comprehension, Third Degree.—The procedure is the same as in previous comprehension questions. Each question may be repeated once or twice, but its form must not be changed. No explanations are permissible.

Scoring.—*Question a* (*If you have broken something*). *Satisfactory responses* are those suggesting either restitution, or apology, or both. Confession is not satisfactory unless accompanied by apology. The following are satisfactory: "Buy a new one." "Pay for it." "Give them something instead of it." "Have my father mend it." "Apologize."

Unsatisfactory:—"Tell them I did it." "Go tell my mother." "Feel sorry." "Be ashamed." "Pick it up," etc. Mere confession accounts for 20% of all failures.

Question b (*In danger of being tardy*). *Satisfactory:*—The expected response is, "Hurry," "Walk faster," or something to that effect.

Unsatisfactory:—" Go to the principal." " Tell the teacher I couldn't help it." " Have to get an excuse." Lack of success results oftenest from failure to get the exact shade of meaning conveyed by the question. It is implied, of course, that something is to be done at once to avoid tardiness; but the subject of dull comprehension may suggest a suitable thing to do in case tardiness has been incurred.

Question c (Playmate hits you). Satisfactory responses are only those which suggest either excusing or overlooking the act. These ideas are variously expressed as follows: " I would excuse him " (about half of all the correct answers). " I would say ' yes ' if he asked my pardon." " I would say it was all right." " I would take it for a joke."

Unsatisfactory responses are all those not of the above two types; as: " I would hit them back." "I would not hit them back, but I would get even some other way." " Tell them not to do it again."

4. Giving Similarities of Two Things.—Procedure.— Say to the child: " *I am going to name two things which are alike in some way, and I want you to tell me how they are alike. Wood and coal: in what way are they alike?* " Proceed in the same manner with: *An apple and a peach. Iron and silver. A ship and an automobile.* After the first pair the formula may be abbreviated to " *In what way are . . . and . . . alike?* " It is often necessary to insist a little if the child is silent or says he does not know, but in doing this we must avoid supplementary questions and suggestions. In giving the first pair, for example, it would not be permissible to ask such additional questions as, " *What do you use wood for? What do you use coal for? And now, how are wood and coal alike?* " This is really putting the answer in the child's mouth. It is only permissible to repeat the original question in a persuasive tone of voice, and perhaps to add: " *I'm sure you can tell me how . . . and . . . are alike,*" or something to that effect. When a difference is given, instead of a similarity, we say: " *No, I want you to tell me how they are alike. In what way are . . . and . . . alike?* "

Scoring.—The test is passed if a likeness is given in *two out of four* comparisons. We accept as satisfactory any real likeness, whether fundamental or superficial, though, of course, the more essential the resemblance, the better indication it is of intelligence. The following are samples of satisfactory and unsatisfactory answers:

(*a*) *Wood and coal. Satisfactory:*—" Both keep you warm." " Both arc used for fuel." " Both are vegetable matter."

Unsatisfactory:—Most frequent is the persistent giving of a difference instead of a similarity. This accounts for a little over half of all the failures. About half of the remainder are cases of inability to give any response. Incorrect statements with regard to color are rather common. Sample failures of this type are: " Both arc black," or " Both the same color." Other failures are: " Both are dirty on the outside; " " You can't break them; " " Coal burns better; " " Wood is lighter than coal," etc.

(*b*) *An apple and a peach. Satisfactory:*—" Both are round." " Both the same shape." " They are about the same color." " Both nearly always have some red on them." " Both good to eat."

Unsatisfactory:—" Both taste the same." " Both have a lot of seeds." " Both have a fuzzy skin." " An apple is bigger than a peach." " One is red and one is white," etc.

(*c*) *Iron and silver. Satisfactory:*—" Both are metals " (or mineral). " Both come out of the ground." " Both cost money." " Both are heavy."

Unsatisfactory:—" Both thin " (or thick). " Sometimes they are the same shape." " Both the same color."

(*d*) *A ship and an automobile. Satisfactory:*—" Both means of travel." " Both go." " You ride in them." " Both take you fast." " They both use fuel."

Unsatisfactory:—" Both black " (or some other color). " Both very big." " They are made alike." " Both run on wheels."

5. Giving Definitions Superior to Use.—Procedure.— The words for this year are *balloon, tiger, football,* and *soldier.* Ask simply: "*What is a balloon?*" etc. If it appears that any of the words are not familiar to the child, substitution may be made from the following: *automobile, battle-ship, potato, store.* Make no comments on the responses until all the words have been given. In case of silence or hesitation in answering, the question may be repeated with a little encouragement; but supplementary questions are never in order. Ordinarily there is no difficulty in securing a response to the definition test of this year. The trouble comes in scoring the response.

Scoring.—The test is passed if two of the four words are defined in terms superior to use. "Superior to use" includes chiefly: (*a*) definitions which describe the object or tell something of its nature (form, size, color, appearance, etc.); (*b*) definitions which give the substance or the materials or parts composing it; and (*c*) those which tell what class the object belongs to or what relation it bears to other classes of objects.

(*a*) *Balloon. Satisfactory:*—"A balloon is a means of traveling through the air." "It is a kind of airship, made of cloth and filled with air so it can go up." "It is big and made of cloth. It has gas in it and carries people up in a basket that's fastened on to the bottom."

Unsatisfactory:—"To go up in the air." "What you go up in." "When you go up." "They go up in it." "It's full of gas."

(*b*) *Tiger. Satisfactory:*—"It is a wild animal of the cat family." "It is an animal that's a cousin to the lion." "It is an animal that lives in the jungle." "It is a wild animal." "It looks like a big cat."

Unsatisfactory:—"To eat you up." "To kill people." "To travel in the circus." "What eats people." "It is a tiger," etc. "You run from it."

(*c*) *Football. Satisfactory:*—"It is a leather bag filled with air and made for kicking." "It is a ball you kick."

"It is a thing you play with." "It is made of leather and is stuffed with air."

Unsatisfactory:—"To kick." "To play with." "What they play with." "Boys play with it." "It's filled with air."

(*d*) *Soldier. Satisfactory:*—"A man who goes to war." "A brave man." "A man that walks up and down and carries a gun."

Unsatisfactory:—"To shoot." "To go to war." "It is a soldier." "A soldier that marches." "He fights." "He shoots."

6. Vocabulary: Twenty Definitions.—Procedure.—Use the list of words given in the record booklet. Say to the child: "*I want to find out how many words you know. Listen; and when I say a word you tell me what it means.*" If the child can read, give him a printed copy of the word list and let him look at each word as you pronounce it.

The words are arranged approximately (though not exactly) in the order of their difficulty, and it is best to begin with the easier words and proceed to the harder. With children under 9 or 10 years, begin with the first. Apparently normal children of 10 years may safely be credited with the first 10 words without being asked to define them. Apparently normal children of 12 may begin with word 16, and 15-year-olds with word 21. Except with subjects of almost adult intelligence there is no need to give the last 10 or 15 words, as these are almost never correctly defined by school children. A safe rule to follow is to continue until 8 or 10 successive words have been missed and to score the remainder *minus* without giving them.

The formula is as follows: "What is an *orange?*" "What is a *bonfire?*" "*Roar;* what does *roar* mean?" "*Gown;* what is a *gown?*" "What does *tap* mean?" "What does *scorch* mean?" "What is a *puddle?*" etc.

Some children at first show a little hesitation about answering, thinking that a strictly formal definition is expected. In such cases a little encouragement is necessary;

as: "*You know what a bonfire is. You have seen a bonfire. Now, what is a bonfire?*" If the child still hesitates, say: "*Just tell me in your own words; say it any way you please. All I want is to find out whether you know what a bonfire is.*" Do not torture the child, however, by undue insistence. If he persists in his refusal to define a word which he would ordinarily be expected to know, it is better to pass on to the next one and to return to the troublesome word later. Above all, avoid helping the child by illustrating the use of a word in a sentence. Adhere strictly to the formula given above. If the definition as given does not make it clear whether the child has the correct idea, say: "*Explain,*" or, "*I don't understand; explain what you mean.*"

Encourage the child frequently by saying: "That's fine. You are doing beautifully. You know lots of words," etc. Never tell the child his definition is not correct, and never ask for a different definition.

Avoid saying anything which would suggest a model form of definition, as the type of definition which the child spontaneously chooses throws interesting light on the degree of maturity of the apperceptive processes. Record all definitions *verbatim* if possible, or at least those which are exceptionally good, poor, or doubtful.

Scoring.—Credit a response in full if it gives one correct meaning for the word, regardless of whether that meaning is the most common one, and regardless of whether it is the original or a derived meaning. Occasionally half credit may be given, but this should be avoided as far as possible.

To find the entire vocabulary, multiply the number of words known by 180. (This list is made up of 100 words selected by rule from a dictionary containing 18,000 words.) Thus, the child who defines 20 words correctly has a vocabulary of $20 \times 180 = 3600$ words; 50 correct definitions would mean a vocabulary of 9000 words, etc. The following are the standards for different years, as determined by the

vocabulary reached by 60 to 65% of the subjects of the various mental levels:

TABLE 17

8 years	20 words	vocabulary 3,600
10 years	30 words	vocabulary 5,400
12 years	40 words	vocabulary 7,200
14 years	50 words	vocabulary 9,000
Average adult	65 words	vocabulary 11,700
Superior adult	75 words	vocabulary 13,500

Although the form of the definition is significant, it is not taken into consideration in scoring. The test is intended to explore the range of ideas rather than the evolution of thought forms. When it is evident that the child has one fairly correct meaning for a word, he is given full credit for it, however poorly the definition may have been stated.

An idea of the degree of leniency to be exercised may be had from the following examples of definitions, which are mostly of low grade, but acceptable unless otherwise indicated: 1. *Orange.* "An orange is to eat." "It is yellow and grows on a tree." 2. *Bonfire.* "You burn it outdoors." "You burn some leaves or things." "It's a big fire." 3. *Roar.* "A lion roars." "You holler loud." 4. *Gown.* "To sleep in." "It's a nightie." "It's a nice gown that ladies wear." 26. *Noticeable.* "You notice a thing." 29. *Civil.* "Civil War." (Failure unless explained.) "It means to be nice." 30. *Treasury.* Give half credit for definitions like "Valuables," "Lots of money." etc.; i.e., if the word is confused with *treasure.* 32. *Ramble.* "To go about fast." 73. *Harpy.* "A kind of bird." 80. *Exaltation.* "You feel good." 85. *Retroactive.* "Acting backward." 92. *Theosophy.* "A religion."

Alternative Test 1: Naming Six Coins.—Procedure is exactly as in VI, 5 (naming four coins). The dollar should be shown before the half-dollar.

Scoring.—*All six coins must be correctly named.* If a response is changed the rule is to count the second answer and ignore the first.

Alternative Test 2: Writing from Dictation.—Procedure.—Give the child pen, ink, and paper, place him in a comfortable position for writing, and say: "*I want you to write something for me as nicely as you can. Write these words: 'See the little boy.' Be sure to write it all: 'See the little boy.'*"

Do not dictate the words separately, but give the sentence as a whole. Further repetition of the sentence is not permissible, as ability to remember what has been dictated is a part of the test. Copy, of course, must not be shown.

Scoring.—Passed if the sentence is written legibly enough to be easily recognized, and if no word has been omitted. Ordinary mistakes of spelling are disregarded. The rule is that the mistake in spelling must not mutilate the word beyond easy recognition.

Instructions for Year IX

1. Giving the Date.—Procedure.—Ask the following questions in order: (*a*) "*What day of the week is it to-day?*" (*b*) "*What month is it?*" (*c*) "*What day of the month is it?*" (*d*) "*What year is it?*"

If the child misunderstands and gives the day of the month for the day of the week, or *vice versa*, we merely repeat the question with suitable emphasis, but give no other help.

Scoring.—An error of three days in either direction is allowed for *c*, but *a*, *b*, and *d* must all be given correctly. If the child makes an error and spontaneously corrects it, the change is allowed, but corrections must not be called for or suggested.

2. Arranging Five Weights.—Procedure.—Place the five blocks on the table in an irregular group before the child and say: "*See these blocks. They all look alike, don't they? But they are not alike. Some of them are heavy, some are not quite so heavy, and some are still lighter. No two weigh the same. Now, I want you to find the heaviest one and place*

it here. Then find the one that is just a little lighter and put it here. Then put the next lighter one here, and the next lighter one here, and the lightest of all at this end (pointing each time at the appropriate spot). *Do you understand?"* Whatever the child answers, in order to make sure that he does understand, we repeat the instructions thus: "*Remember now, that no two weights are the same. Find the heaviest one and put it here, the next heaviest here, and lighter, lighter, until you have the very lightest here. Ready; go ahead.*"

It is best to follow very closely the formula here given, otherwise there is danger of stating the directions so abstractly that the subject could not comprehend them. A formula like "*I want you to arrange the blocks in a gradually decreasing series according to weight*" would be Greek to most children of ten years.

If the subject still seems at a loss to know what to do, the instructions may be again repeated. But no further help of any kind may be given. Do not tell the subject to take the blocks one at a time in the hand and try them, and do not illustrate by hefting the blocks yourself. It is a part of the test to let the subject find his own method.

Give three trials, shuffling the blocks after each. Do not repeat the instructions before the second and third trials unless the subject has used an absurd procedure in the previous trial.

Scoring.—The test is passed if the blocks are arranged in the correct order *twice out of three trials.*

3. Making Change.—Procedure.—Ask the following questions in the order here given: (*a*) "*If I were to buy* 4 *cents' worth of candy and should give the storekeeper* 10 *cents, how much money would I get back?*" (*b*) "*If I bought* 12 *cents' worth and gave the storekeeper* 15 *cents, how much would I get back?*" (*c*) "*If I bought* 4 *cents' worth and gave the storekeeper* 25 *cents, how much would I get back?*"

Coins are not used, and the subject is not allowed the help of pencil and paper. If the subject forgets the statement of the problem, it is permissible to repeat it once,

but only once. The response should be made in ten or fifteen seconds for each problem.

Scoring.—The test is passed if *one out of three* problems is answered correctly in the allotted time. In case two answers are given to a problem, we follow the usual rule of counting the second and ignoring the first.

4. Repeating Four Digits Reversed.—Procedure and Scoring.—Exactly as in VII, alternate test 2. The series are 6–5–2–8; 4–9–3–7; 3–6–2–9.

5. Using Three Words in a Sentence.—Procedure.—Say: "*You know what a sentence is, of course. A sentence is made up of some words which say something. Now, I am going to give you three words, and you must make up a sentence that has all three words in it. The three words are 'boy,' 'ball,' 'river.' Go ahead and make up a sentence that has all three words in it.*" The others are given in the same way.

Note that the subject is not shown the three words written down, and that the reply is to be given orally.

If the subject does not understand what is wanted, the instruction may be repeated, but it is not permissible to illustrate what a sentence is by giving one. There must be no preliminary practice.

A curious misunderstanding which is sometimes encountered comes from assuming that the sentence must be constructed entirely of the three words given. If it appears that the subject is stumbling over this difficulty, we explain: "*The three words must be put with some other words so that all of them together will make a sentence.*"

Nothing is said about hurrying, but if a sentence is not given within one minute the rule is to count that part of the test a failure and to proceed to the next trio of words.

Give only one trial for each part of the test.

Do not specially caution the child to avoid giving more than one sentence, as this is implied in the formula used and should be understood.

Scoring.—The test is passed if *two of the three* sentences are satisfactory. In order to be satisfactory a sentence must fulfill the following requirements: (1) It must either be a simple sentence, or, if compound, must not contain more than two distinct ideas; and (2) it must not express an absurdity.

Slight changes in one or more of the key words are disregarded, as *rivers* for *river*, etc.

(*a*) *Boy, ball, river. Satisfactory:*—" The boy threw his ball into the river." " A boy went to the river and took his ball with him." " The boy ran after his ball which was rolling toward the river." " The boy had a ball and he lost it in the river."

Unsatisfactory:—" There was a boy, and he bought a ball, and it fell into the river." " The boy was swimming in the river and he was playing ball."

(*b*) *Work, money, men. Satisfactory:*—" Men work and they earn money."

Unsatisfactory:—" Men work with their money."

(*c*) *Desert, rivers, lakes. Satisfactory:*—" The desert has one river and one lake." " There was a desert and near by there was a river that emptied into a lake."

Unsatisfactory:—" A desert is dry, rivers are long, lakes are rough." " The desert is full of rivers and lakes."

6. Finding Rhymes.—Procedure.—Say to the child: " *You know what a rhyme is, of course. A rhyme is a word that sounds like another word. Two words rhyme if they end in the same sound. Understand?* " Whether the child says he understands or not, we proceed to illustrate what a rhyme is, as follows: " *Take the two words ' hat ' and ' cat.' They sound alike and so they make a rhyme. ' Hat,' ' rat,' ' cat,' ' bat ' all rhyme with one another.*"

That is, we first explain what a rhyme is and then we give an illustration. A large majority of American children who have reached the age of nine years understand perfectly what a rhyme is, without any illustration. A few, however, think they understand, but do not; and in order

to insure that all are given equal advantage it is necessary never to omit the illustration.

After the illustration say: "*Now I am going to give you a word and you will have one minute to find as many words as you can rhyme with it. The word is 'day.' Name all the words you can think of that rhyme with 'day.'*"

If the child fails with the first word, before giving the second we repeat the explanation and give sample rhymes for *day;* otherwise we proceed without further explanation to *mill* and *spring*, saying, "*Now, you have another minute to name all the words you can think of that rhyme with 'mill,'*" etc. Apart from the mention of "one minute" say nothing to suggest hurrying, as this tends to throw some children into mental confusion.

Scoring.—Passed if in *two out of three* parts of the experiment the child finds *three words* which rhyme with the word given, the time limit for each series being *one minute*. Note that in each case there must be three words in addition to the word given. These must be real words, not meaningless syllables or made-up words. However, we should be liberal enough to accept such words as *ding* (from "ding-dong") for *spring*, *Jill* (see "Jack and Jill") for *mill*, *Fay* (girl's name) for *day*, etc.

Alternative Test 1: Naming the Months.—Procedure.—Simply ask the subject to "*name all the months of the year.*" Do not start him off by naming one month; give no look of approval or disapproval as the months are being named, and make no suggestions or comments of any kind.

When the months have been named, we "check up" the performance by asking: "*What month comes before April?*" "*What month comes before July?*" "*What month comes before November?*"

Scoring.—Passed if the months are named in about *fifteen or twenty seconds with no more than one error* of omission, repetition, or displacement, and if *two out of the three check questions* are answered correctly. Disregard place of beginning.

Alternative Test 2: Counting the Value of Stamps.—Procedure.—Place before the subject a cardboard on which are pasted three 1-cent and three 2-cent stamps arranged as follows: 111222. Be sure to lay the card so that the stamps will be right side up for the child. Say: "*You know, of course, how much a stamp like this costs* (pointing to a 1-cent stamp). *And you know how much one like this costs* (pointing to a 2-cent stamp). *Now, how much money would it take to buy all these stamps?*"

Do not tell the individual values of the stamps if these are not known, for it is a part of the test to ascertain whether the child's spontaneous curiosity has led him to find out and remember their values. If the individual values are known, but the first answer is wrong, a second trial may be given. In such cases, however, it is necessary to be on guard against guessing.

If the child merely names an incorrect sum without saying anything to indicate how he arrived at his answer, it is well to tell him to figure it up aloud. "*Tell me how you got it.*"

Scoring.—Passed if the correct value is given in not over fifteen seconds.

Instructions for Year X

1. Vocabulary: Thirty Definitions.—Procedure and **scoring** as in VIII, 6. At year X, thirty words should be correctly defined.

2. Detecting Absurdities.—Procedure.—Say to the child: "*I am going to read a sentence which has something foolish in it, some nonsense. I want you to listen carefully and tell me what is foolish about it.*" Then read the sentences, rather slowly and in a matter-of-fact voice, saying after each: "*What is foolish about that?*"

Each should ordinarily be answered within thirty seconds. If the child is silent, the sentence should be repeated; but no other questions or suggestions of any kind are permissible. Such questions as "*Could the road be downhill both*

ways?" or, "*Do you think the girl could have killed herself?"* would, of course, put the answer in the child's mouth. It is even best to avoid laughing as the sentence is read.

Owing to the child's limited power of expression it is not always easy to judge from the answer given whether the absurdity has really been detected or not. In such cases ask him to explain himself, using some such formula as: "*I am not sure I know what you mean. Explain what you mean. Tell me what is foolish in the sentence I read.*" This usually brings a reply the correctness or incorrectness of which is more apparent, while at the same time the formula is so general that it affords no hint as to the correct answer. Additional questions must be used with extreme caution.

Scoring.—Passed if the absurdity is detected in *four out of the five* statements.

(*a*) *The road downhill. Satisfactory:*—"If it was downhill to the city it would be uphill coming back." "It can't be downhill both directions." "That could not be."

Unsatisfactory:—"Perhaps he took a little different road coming back." "I guess it is a very crooked road." "Coming back he goes around the hill." "The man lives down in a valley."

(*b*) *What the engineer said. Satisfactory:*—"If he has more cars he will go slower." "It is the other way. If he wants to go faster he must not have so many cars."

Unsatisfactory:—"A long train is nicer." "The engine pulls harder if the train has lots of cars."

(*c*) *The girl who was thought to have killed herself. Satisfactory:*—"She could not have cut herself into eighteen pieces." "She would have been dead before that." "She might have cut two or three pieces off, but she couldn't do the rest."

Unsatisfactory:—"*Think* that she killed herself; they *know* she did." "They can't be sure. Someone may have killed her." "It was a foolish girl to kill herself."

(*d*) *The railroad accident. Satisfactory:*—" That was very serious." " I should like to know what you would call a serious accident!"

Unsatisfactory:—" It was a foolish mistake that made the accident." " They couldn't help it. It was an accident."

(*e*) *The bicycle rider. Satisfactory:*—" How could he get well after he was already killed? " " Why, he's already dead."

Unsatisfactory:—" Foolish to fall off a bicycle. He should have known how to ride." " They ought to have carried him home. (Why?) So his folks could get a doctor."

3. Drawing Designs from Memory.—Procedure.—Use the designs shown on the printed form. If copies are used they must be exact in size and shape. Before showing the card say: "*This card has two drawings on it. I am going to show them to you for ten seconds, then I will take the card away and let you draw from memory what you have seen. Examine both drawings carefully and remember that you have only ten seconds.*"

Provide pencil and paper and then show the card for ten seconds, holding it at right angles to the child's line of vision and with the designs in the position given in the plate. Have the child draw the designs immediately after they are removed from sight.

Scoring.—The test is passed if *one of the designs is reproduced correctly and the other about half correctly.* " Correctly " means that the *essential plan* of the design has been grasped and reproduced. Ordinary irregularities due to lack of motor skill or to hasty execution are disregarded. " Half correctly " means that some essential part of the design has been omitted or misplaced, or that parts have been added.

The sample reproductions shown on the scoring card will serve as a guide. It will be noted that an inverted design, or one whose right and left sides have been transposed, is counted only half correct, however perfect it may

be in other respects; also that design *b* is counted only half correct if the inner rectangle is not located off center.

4. Reading for Eight Memories.—Procedure.—Hand the selection to the subject, who should be seated comfortably in a good light, and say: "*I want you to read this for me as nicely as you can.*" The subject must read aloud.

Pronounce all the words which the subject is unable to make out, not allowing more than five seconds' hesitation in such a case.

Record all errors made in reading the selection, and the exact time. By "error" is meant the omission, substitution, transposition, or mispronunciation of one word.

The subject is not warned in advance that he will be asked to report what he has read, but as soon as he has finished reading, put the selection out of sight and say: "*Very well done. Now, I want you to tell me what you read. Begin at the first and tell everything you can remember.*" After the subject has repeated everything he can recall and has stopped, say: "*And what else? Can you remember any more of it?*" Give no other aid of any kind. It is of course not permissible, when the child stops, to prompt him with such questions as, "*And what next? Where were the houses burned? What happened to the fireman?*" etc. The report must be spontaneous.

Now and then, though not often, a subject hesitates or even refuses to try, saying he is unable to do it. Perhaps he has misunderstood the request and thinks he is expected to repeat the selection word for word, as in the tests of memory for sentences. We urge a little and repeat: "*Tell me in your own words all you can remember of it.*" Others misunderstand in a different way, and thinking they are expected to tell merely what the story is about, they say: "It was about some houses that burned." In such cases we repeat the instructions with special emphasis on the words *all you can remember.*

Scoring.—The test is passed *if the selection is read in thirty-five seconds with not more than two errors, and if the*

report contains at least eight "memories." By underscoring the memories correctly reproduced, and by interlineations to show serious departures from the text, the record can be made complete with a minimum of trouble.

The main difficulty in scoring is to decide whether a memory has been reproduced correctly enough to be counted. Absolutely literal reproduction is not expected. The rule is to count all memories whose thought is reproduced with only minor changes in the wording. "It took quite a while" instead of "it took some time" is satisfactory; likewise, "got burnt" for "was burned"; "who was sleeping" for "who was asleep"; "are homeless" for "lost their homes"; "in the middle" for "near the center"; "a big fire" for "a fire," etc.

Memories as badly mutilated as the following, however, are not counted: "A lot of buildings" for "three houses;" "a man" for "a fireman"; "who was sick" for "who was asleep"; etc. Occasionally we may give half credit, as in the case of "was seventeen thousand dollars" for "was fifty thousand dollars"; "and fifteen families" for "and seventeen families," etc.

5. Comprehension, Fourth Degree.—The **procedure** is the same as for the previous comprehension tests. Each question may be repeated, but its form must not be changed. It is not permissible to make any explanation whatever as to the meaning of the question, except to substitute *beginning* for *undertaking* when (*b*) seems not to be comprehended.

Scoring.—*Two out of the three* questions must be answered satisfactorily. Study of the following classified responses should make scoring fairly easy in most cases:

(*a*) *When someone asks your opinion. Satisfactory:*—"I would say I don't know him very well" (42% of the correct answers). "Tell him what I know and no more" (34% of correct answers). "I would say that I'd rather not express any opinion about him" (20% of the correct answers). "Tell him to ask someone else." "I would not express any opinion."

Unsatisfactory:—Unsatisfactory responses are due either to failure to grasp the import of the question, or to inability to suggest the appropriate action demanded by the situation.

The latter form of failure is the more common; e.g.: "I'd say they are nice." "Say you like them." "Say what I think."

(*b*) *Before undertaking something important. Satisfactory:*—"Think about it." "Get everything ready." "Ask advice." "Try something easier first." "See whether it would be possible."

Unsatisfactory:—"Promise to do your best." "Begin at the beginning." "Do what is right." "Just start doing it."

(*c*) *Why we should judge a person more by his actions than by his words. Satisfactory:*—"He might talk nice and do bad things." "You can tell by his actions whether he is good or not." "Because you can't always believe what people say." "He might talk ugly and still not do bad things."

Unsatisfactory:—"It shows he is polite if he acts nice." "A fellow don't know what he says." "If he doesn't act right you know he won't talk right." "Might get embarrassed and not talk good."

6. Naming Sixty Words.—Procedure.—Say: "*Now, I want to see how many different words you can name in three minutes. When I say ready, you must begin and name the words as fast as you can, and I will count them. Do you understand? Be sure to do your very best, and remember that just any words will do, like 'clouds,' 'dog,' 'chair,' 'happy' —Ready; go ahead!*"

The instructions may be repeated if the subject does not understand what is wanted. As a rule the task is comprehended instantly and entered into with great zest.

Do not stare at the child, and do not say anything as the test proceeds unless there is a pause of fifteen seconds. In this event say: "*Go ahead, as fast as you can. Any*

words will do." Repeat this urging after every pause of fifteen seconds.

Some subjects, usually rather intelligent ones, hit upon the device of counting or putting words together in sentences. We then break in with: "*Counting* (or *sentences*, as the case may be) *not allowed. You must name separate words. Go ahead.*"

Record the individual words if possible, and mark the end of each half-minute. If the words are named so rapidly that they cannot be taken down, it is easy to keep the count by making a pencil stroke for each word. If the latter method is employed, repeated words may be indicated by making a cross instead of a single stroke. Always make record of repetitions.

Scoring.—The test is passed if *sixty* words, exclusive of repetition, are named in three minutes. It is not allowable to accept twenty words in one minute or forty words in two minutes as an equivalent of the expected score. Only real words are counted.

Alternative Test 1: Repeating Six Digits.—The digits series used are 3–7–4–8–5–9 and 5–2–1–7–4–6.

The **procedure** and **scoring** are the same as in VII, 3, except that only two trials are given, one of which must be correct.

Alternative Test 2: Repeating Twenty to Twenty-two Syllables.—**Procedure** and **scoring** exactly as in VI, 6.

Alternative Test 3: Construction Puzzle (Healy and Fernald).—**Procedure.**—Place the frame on the table before the subject, the short side nearest him. The blocks are placed in an irregular position on the side of the frame away from the subject. Take care that the board with the blocks in place is not exposed to view in advance of the experiment.

Say: "*I want you to put these blocks in this frame so that all the space will be filled up. If you do it rightly they will all fit in and there will be no space left over. Go ahead.*"

Do not tell the subject to see how quickly he can do it.

Say nothing that would even suggest hurrying, for this tends to call forth the trial-and-error procedure even with intelligent subjects.

Scoring.—The test is passed if the child succeeds in fitting the blocks into place *three times in a total time of five minutes for the three trials.*

Instructions for Year XII

1. Vocabulary: Forty Definitions.—Procedure and **scoring** as in previous vocabulary tests.

2. Defining Abstract Words.—Procedure.—The words to be defined are *pity*, *revenge*, *charity*, *envy*, and *justice*. The formula is, "*What is pity? What do we mean by pity?*" and so on with the other words. If the meaning of the response is not clear, ask the subject to explain what he means. If the definition is in terms of the word itself, as "Pity means to pity someone." "Revenge is to take revenge," etc., it is then necessary to say: "*Yes, but what does it mean to pity someone?*" or, "*What does it mean to take revenge?*" etc. Only supplementary questions of this kind are permissible.

Scoring.—The test is passed if *three of the five* words are satisfactorily defined. The definition need not be strictly logical nor the language elegant. It is sufficient if the definition shows that the meaning of the word is known. Definitions which define by means of an illustration are acceptable. The following are samples of satisfactory and unsatisfactory responses:

(*a*) *Pity. Satisfactory:*—"To be sorry for someone." "If anybody gets hurt real bad you pity them." "You see something that's wrong and have your feeling aroused."

Unsatisfactory:—"To think of the poor." "To cheer people up." "It's when you break something."

(*b*) *Revenge. Satisfactory:*—"To get even with someone." "To hurt them back." "You kill a person if he does something to you."

Unsatisfactory:—" To be mad." " To kill them." " To hate someone who has done you wrong."

(*c*) *Charity. Satisfactory:*—" To give to the poor." " To give to somebody without pay."

Unsatisfactory:—" A place where poor people get food and things." " Charity is being treated good."

(*d*) *Envy. Satisfactory:*—" You envy someone who has something you want." " It's when you see a person better off than you are."

Unsatisfactory:—" To hate someone." " Bad feeling toward anyone."

(*e*) *Justice. Satisfactory:*—" To give people what they deserve." " If one does something and gets punished, that's justice."

Unsatisfactory:—" It means to have peace." " It is where they have court."

3. The Ball-and-field Test (Superior Plan).—Procedure, as in year VIII, test 1.

Scoring.—Score 3 (or superior plan) is required for passing in year XII. (See scoring card.)

4. Dissected Sentences.—The Stanford record booklet contains the sentences in convenient form.

It is not permissible to substitute written words or printed script, as that would make the test harder. All the words should be printed in caps in order that no clue shall be given as to the first word in a sentence. For a similar reason the period is omitted.

Procedure.—Say: "*Here is a sentencc that has the words all mixed up so that they don't make any sensc. If the words were changed around in the right order they would make a good sentence. Look carefully and see if you can tell me how the sentence ought to read.*"

Give the sentences in the order in which they are listed in the record booklet. Do not tell the subject to see how quickly he can do it, because with this test any suggestion of hurrying is likely to produce a kind of mental paralysis. If the subject has no success with the first sentence in one

minute, read it off correctly for him, somewhat slowly, and pointing to each word as it is spoken. Then proceed to the second and third, allowing one minute for each.

Give no further help. It is not permissible, in case any incorrect response is given, to ask the subject to try again, or to say: "*Are you sure that is right?*" "*Are you sure you have not left out any words?*" etc. Instead, maintain absolute silence. However, the subject is permitted to make as many changes in his response as he sees fit, provided he makes them spontaneously and within the allotted time. Record the entire response.

Once in a great while the subject misunderstands the task and thinks the only requirements is to use all the words given, and that it is permitted to add as many other words as he likes. It is then necessary to repeat the instructions and to allow a new trial.

Scoring.—*Two sentences out of three must be correctly given within the minute allotted to each.* It is understood, of course, that if the first sentence has to be read for the subject, both the other responses must be given correctly.

A sentence is not counted correct if a single word is omitted, altered, or inserted, or if the order given fails to make perfect sense.

Certain responses are not absolutely incorrect, but are objectionable as regards sentence structure, or else fail to give the exact meaning intended. These are given half credit. Full credit on one, and half credit on each of the other two, is satisfactory.

(*a*) *Satisfactory:*—" We started for the country at an early hour." " At an early hour we started for the country." " We started at an early hour for the country."

Unsatisfactory:—" We started early at an hour for the country." " Early at an hour we started for the country." " We started early for the country."

Half credit:—" For the country at an early hour we started." " For the country we started at an early hour."

(*b*) *Satisfactory:*—"I asked my teacher to correct my paper."

Unsatisfactory:—"My teacher asked to correct my paper." "To correct my paper I asked my teacher."

Half credit:—"My teacher I asked to correct my paper."

(*c*) *Satisfactory:*—"A good dog defends his master bravely." "A good dog bravely defends his master."

Unsatisfactory:—"A dog defends his master bravely." "A bravely dog defends his master." "A good dog defends his bravely master." "A good brave dog defends his master."

Half credit:—"A dog defends his good master bravely." "A dog bravely defends his good master." "A good master bravely defends his dog."

5. Interpretation of Fables.—Procedure.—Present the fables in the order in which they are given in the record booklet. The method is to say to the subject: "*You know what a fable is? You have heard fables?*" Whatever the answer, proceed to explain a fable as follows: "*A fable, you know, is a little story, and is meant to teach us a lesson. Now, I am going to read a fable to you. Listen carefully, and when I am through I will ask you to tell me what lesson the fable teaches us. Ready; listen.*" After reading the fable, say: "*What lesson does that teach us?*" Record the response *verbatim* and proceed with the next as follows: "*Here is another. Listen again and tell me what lesson this fable teaches us,*" etc.

As far as possible, avoid comment or commendation until all the fables have been given. If the first answer is of an inferior type and we express too much satisfaction with it, we thereby encourage the subject to continue in his error. On the other hand, never express dissatisfaction with a response, however absurd or *malapropos* it may be. Many subjects are anxious to know how well they are doing and continually ask, "Did I get that one right?" It is sufficient to say, "You are getting along nicely," or something to that effect. Offer no comments, suggestions, or questions which might put the subject on the right track. This much

self-control is necessary if we would make the conditions of the test uniform for all subjects.

The only occasion when a supplementary question is permissible is in case of a response whose meaning is not clear. Even then we must be cautious and restrict ourselves to some such question as, "*What do you mean?*" or, "*Explain; I don't quite understand what you mean.*" The scoring of fables is somewhat difficult at best, and this additional question is often sufficient to place the response very definitely in the right or wrong column.

Scoring.—Give score 2, i.e., 2 points, for a correct answer, and 1 for an answer which deserves half credit. The test is passed in year XII *if* 4 *points are earned;* that is, if two responses are correct or if one is correct and two deserve half credit.

Score 2 means that the fable has been correctly interpreted and that the lesson it teaches has been stated in general terms.

There are two types of responses which may be given half credit. They include (1) the interpretations which are stated in general terms and are fairly plausible, but are not exactly correct; and (2) those which are perfectly correct as to substance, but are not generalized.

We overlook ordinary faults of expression and regard merely the essential meaning of this response.

(*a*) *Hercules and the wagoner. Full credit; score* 2:—"Do not depend on others." "It teaches that we should rely upon ourselves." "We should always try, even if it looks hard and we think we can't do it."

Half credit; score 1:—This is most often given for the response which contains the correct idea, but states it in terms of the concrete situation, e.g.: "The man ought to have tried himself first." "Hercules wanted to teach the man to help himself."

Unsatisfactory; score 0:—"Teaches us to look where we are going." "Not to get stuck in the mud." "He wanted the man to help the oxen."

(*b*) *The Maid and the Eggs. Full credit; score* 2:—"Teaches us not to build air-castles." "Not to plan too far ahead." "Never make too many plans."

Half credit; score 1:—"She was building air-castles and so lost her milk." "To keep our mind on what we are doing." "Not to imagine; go ahead and do it."

Unsatisfactory; score 0:—"Not to take risks like that." "To keep your chickens and you will make more money." "She wanted the money."

(*c*) *The Fox and the Crow. Full credit; score* 2:—"It is not safe to believe people who flatter us."

Half credit; score 1:—"The crow listened to flattery and got left." "Not to be proud and let people think you can sing when you can't." "Not to be too proud." "Not to do everything people tell you."

Unsatisfactory; score 0:—"To share your food." "Not to listen to evil." "Never listen to advice." "Not to sing before you eat." "Not to hold a thing in your mouth; eat it." "To swallow it before you sing." "The fox was slicker than what the crow was." "The fox wanted the meat and just told the crow that to get it."

(*d*) *The Farmer and the Stork. Full credit; score* 2:—"Teaches us to keep out of bad company." "Birds of a feather flock together."

Half credit; score 1:—"The stork should not have been with the cranes." "Not to follow others."

Unsatisfactory; score 0:—"Not to tell lies." "Not to give excuses." "Not to trust what people say." "To tend to your own business." "Taught the stork to keep out of the man's field." "Served the stork right, he was stealing too."

(*e*) *The Miller, His Son, and the Donkey. Full credit; score* 2:—"Don't take everyone's advice." "Don't try to do what everybody tells you." "Use your own judgment."

Half credit; score 1:—"Don't take foolish advice." "They were fools to listen to everybody."

Unsatisfactory; score 0:—" To do what people tell you." " Not to be cruel to animals." " That it is always better to leave things as they are." " Not to try to carry the donkey." " That the father should be allowed to ride." " The men were too heavy for the donkey."

6. Repeating Five Digits Reversed.—The series are 3–1–8–7–9; 6–9–4–8–2; 5–2–9–6–1.

Procedure and **Scoring.**—Exactly as in years VII and IX.

7. Interpretation of Pictures.—Procedure.—Use the same pictures as in III, 1, and VII, 2, and the additional picture *d.* Present in the same order. The formula to begin with is identical with that in VII, 2: " *Tell me what this picture is about. What is this a picture of?* " This formula is chosen because it does not suggest specifically either description or interpretation, and is therefore adapted to show the child's spontaneous or natural mode of apperception. However, in case this formula fails to bring spontaneous interpretation for three of the four pictures, we then return to those pictures on which the subject has failed and give a second trial with the formula: "*Explain this picture.*" A good many subjects who failed to interpret the pictures spontaneously do so without difficulty when the more specific formula is used.

If the response is so brief as to be difficult to classify, the subject should be urged to amplify by some such injunction as "*Go ahead,*" or "*Explain what you mean.*"

One more caution. It is necessary to refrain from voicing a single word of commendation or approval until all the pictures have been responded to. A moment's thought will reveal the absolute necessity of adhering to this rule. Often a subject will begin by giving an inferior type of response (description, say) to the first picture, but with the second picture adjusts better to the task and responds satisfactorily. If in such a case the first (unsatisfactory) response were greeted with an approving " That's fine, you

are doing splendidly," the likelihood of any improvement taking place as the test proceeds would be greatly lessened.

Scoring.—*Three pictures out of four* must be satisfactorily interpreted. "Satisfactorily" means that the interpretation given should be reasonably plausible; not necessarily the exact one the artist had in mind, yet not absurd.

(*a*) *Dutch Home. Satisfactory:*—"Child has spilled something and is getting a scolding." "The baby is crying because she is hungry and the mother has nothing to give her." "It's a poor family. The father is dead and they don't have enough to eat."

Unsatisfactory:—"The baby is crying and the mother is looking at her" (description). "It's in Holland, and there's a little girl crying, and a mamma, and there's a dish on the table" (mainly description). "The mother is teaching the child to walk" (absurd interpretation).

(*b*) *River Scene. Satisfactory:*—"I think it represents a honeymoon trip." "It's a perilous journey and they have engaged the Indian to row for them."

Unsatisfactory:—"An Indian rowing a man and his wife down the river" (mainly description). "A storm at sea" (absurd interpretation). "Indians have rescued a couple from a shipwreck." "They have been up the river and are riding down the rapids."

(*c*) *Post-Office. Satisfactory:*—"There's something funny in the paper about one of the men and they are all laughing about it." "It's a bunch of country politicians reading the election news."

Unsatisfactory:—"It's a little country town and they are looking at the paper." "A man is reading the paper and the others are looking on and laughing." "They are laughing about something in the newspaper."

(*d*) *Colonial Home. Satisfactory:*—"They are lovers and have quarreled." "The woman is crying because her husband is angry and leaving her."

Unsatisfactory:—"The husband is leaving and the dog

is looking at the lady." "The lady is crying and the man is trying to comfort her." "They have lost their money and they are sad" (gratuitous interpretation).

8. Giving Similarities of Three Things.—Procedure.— The procedure is the same as in VIII, 4, but with the following words: (*a*) *Snake, cow, sparrow.* (*b*) *Book, teacher, newspaper.* (*c*) *Wool, cotton, leather.* (*d*) *Knife-blade, penny, piece of wire.* (*e*) *Rose, potato, tree.* As before, a little tactful urging is occasionally necessary in order to secure a response.

Scoring.—*Three satisfactory responses out of five* are necessary for success. Any real similarity is acceptable, whether fundamental or superficial, although the giving of fundamental likenesses is especially symptomatic of good intelligence.

Failures may be classified under four heads: (1) Leaving one of the words out of consideration; (2) giving a difference instead of a similarity; (3) giving a similarity that is not real or that is too bizarre or far-fetched; and (4) inability to respond.

This test provokes doubtful responses somewhat oftener than the earlier test of giving similarities. Those giving greatest difficulty are the indefinite statements like "All are useful," "All are made of the same material," etc. Fortunately, in most of these cases an additional question is sufficient to determine whether the subject has in mind a real similarity. Questions suitable for this purpose are: "Explain what you mean," "In what respect are they all useful?" "What material do you mean?" etc. Of course it is only permissible to make use of supplementary questions of this kind when they are necessary in order to clarify a response which has already been made.

(*a*) *Snake, cow, sparrow. Satisfactory:*—"All are animals." "All move about."

Unsatisfactory:—"All have legs." "All walk on the ground." "A snake crawls, a cow walks, and a sparrow flies."

(*b*) *Book, teacher, newspaper. Satisfactory:*—" You learn from all." " All help you get an education."

Unsatisfactory:—" All tell you the news." " A teacher writes, and a book and newspaper have writing."

(*c*) *Wool, cotton, leather. Satisfactory:*—" All used for clothing." " We wear them all."

Unsatisfactory:—" All grow on animals." " They are pretty."

(*d*) *Knife-blade, penny, piece of wire. Satisfactory:*—" All are made from minerals."

Unsatisfactory:—" All are made of steel." " You buy them with money." " One is sharp, one is round, and one is long."

(*e*) *Rose, potato, tree. Satisfactory:*—" All grow from the ground."

Unsatisfactory:—" All are pretty." " All are valuable."

INSTRUCTIONS FOR YEAR XIV

1. Vocabulary: Fifty Definitions.—Procedure and Scoring, as in VIII, X, and XII.

2. Induction Test: Finding a Rule.—Procedure.—Provide six sheets of thin blank paper, say $8\frac{1}{2}$ by 11 inches. Take the first sheet, and telling the subject to watch what you do, fold it once, and in the middle of the folded edge tear out or cut out a small notch; then ask the subject to tell you *how many holes there will be in the paper when it is unfolded.* The correct answer, *one,* is nearly always given without hesitation. But whatever the answer, unfold the paper and hold it up broadside for the subject's inspection. Next, take another sheet, fold it once as before and say: " *Now, when we folded it this way and tore out a piece, you remember it made one hole in the paper. This time we will give the paper another fold and see how many holes we shall have.*" Then proceed to fold the paper again, this time in the other direction, and tear out a piece from the folded side and ask how many holes there will be when the paper is unfolded. After recording the answer, unfold the paper,

hold it up before the subject so as to let him see the result. The answer is often incorrect and the unfolded sheet is greeted with an exclamation of surprise. The governing principle is seldom made out at this stage of the experiment. But regardless of the correctness or incorrectness of the first and second answers, proceed with the third sheet. Fold it once and say: "*When we folded it this way there was one hole.*" Then fold it again and say: "*And when we folded it this way there were two holes.*" At this point fold the paper a third time and say: "*Now, I am folding it again. How many holes will it have this time when I unfold it?*" Record the answer and again unfold the paper while the subject looks on.

Continue in the same manner with sheets four, five, and six, adding one fold each time. In folding each sheet recapitulate the results with the previous sheets, saying (with the sixth, for example): "*When we folded it this way there was one hole, when we folded it again there were two, when we folded it again there were four, when we folded it again there were eight, when we folded it again there were sixteen; now, tell me how many holes there will be if we fold it once more.*" In the recapitulation avoid the expression "*When we folded it once, twice, three times,*" etc., as this often leads the subject to double the numeral heard instead of doubling the number of holes in the previously folded sheet. After the answer is given, do not fail to unfold the paper and let the subject view the result.

Scoring.—The test is passed *if the rule is grasped by the time the sixth sheet is reached;* that is, the subject may pass after five incorrect responses, provided the sixth is correct and the governing rule can then be given. It is not permissible to ask for the rule until all six parts of the experiment have been given. Nothing must be said which could even suggest the operation of a rule. Often, however, the subject grasps the principle after two or three steps and gives it spontaneously. In this case it is unnecessary to proceed with the remaining steps.

3. Giving Differences between a President and a King.—Procedure.—Say: " *There are three main differences between a president and a king; what are they?* " If the subject stops after one difference is given, we urge him on, if possible, until three are given.

Scoring.—The three differences relate to power, tenure, and manner of accession. Only these differences are considered correct, and the successful response must include at least two of the three. We disregard crudities of expression and note merely whether the subject has the essential idea. As regards power, for example, any of the following responses are satisfactory: " The king is absolute and the president is not." " The king rules by himself, but the president rules with the help of the people." " Kings can have things their own way more than presidents can," etc.

It may be objected that the reverse of this is sometimes true, that the king of to-day often has less power than the average president. Sometimes subjects mention this fact, and when they do we credit them with this part of the test. As a matter of fact, however, this answer is seldom given.

Sometimes the subject does not stop until he has given a half-dozen or more differences, and in such cases the first three differences may be trivial and some of the later ones essential. The question then arises whether we should disregard the errors and pass the subject on his later correct responses. The rule in such cases is to ask the subject to pick out the " three main differences."

Sometimes accession and tenure are given in the form of a single contrast, as: " The president is elected, but the king inherits his throne and rules for life." This answer entitles the subject to credit for both accession and tenure, the contrast as regards tenure being plainly implied.

4. Problem Questions.—Procedure.—Say to the subject: "*Listen, and see if you can understand what I read.*" Then read the three problems, rather slowly and with expression, pausing after each long enough for the subject to find an answer.

Do not ask questions calculated to draw out the correct response, but wait in silence for the subject's spontaneous answer. It is permissible, however, to re-read the passage if the subject requests it.

Scoring.—*Two responses out of three must be satisfactory.*

(*a*) *What the man saw hanging. Satisfactory:*—The only correct answer for the first is " A man who had hung himself " (or who had committed suicide, been hanged, etc.). We may also pass the following answer: " Dead branches that looked like a man hanging."

Unsatisfactory:—There is an endless variety of failures: " A snake," " A monkey," " A robber," or " A tramp."

(*b*) *My neighbor. Satisfactory:*—The expected answer is " A death," " Someone has died," etc. We must always check up this response, however, by asking what the lawyer came for, and this must also be answered correctly. " A murder. The doctor came to examine the body, the lawyer to get evidence, and the preacher to preach at the funeral."

If an incorrect answer is first given and then corrected, the correction is accepted.

Unsatisfactory:—The failures again are quite varied, but are most frequently due to failure to understand the lawyer's mission. " A baby born." " An entertainment." " Some friends came to chat." " Somebody was sick; the lawyer wanted his money and the minister came to see how he was."

(*c*) *What the man was riding on.*—The only correct response is " Bicycle." The most common error is *horse* (or *donkey*), accounting for 48 out of 71 tabulated failures. Vehicles, like *wagon*, *buggy*, *automobile*, or *street car*, were mentioned in 14 out of 71 failures.

5. Arithmetical Reasoning.—Procedure.—The problems are shown one at a time to the subject, who reads each problem aloud and (with the printed problem still before him) finds the answer without the use of pencil or paper.

Only one minute is allowed for each problem, but nothing is said about hurrying. While one problem is being solved the others should be hidden from view. It is not permissible,

if the subject gives an incorrect answer, to ask him to solve the problem again. The following exception, however, is made to this rule: if the answer given to the third problem indicates that the word *yard* has been read as *feet*, the subject is asked to read the problem through again carefully (aloud) and to tell how he solved it. No further help of any kind may be given.

Scoring.—*Two of the three* problems must be solved correctly within the minute allotted to each. No credit is allowed for correct method if the answer is wrong.

6. Reversing Hands of Clock.—Procedure.—Say to the subject: "*Suppose it is six-twenty-two o'clock, that is, twenty-two minutes after six; can you see in your mind where the large hand would be, and where the small hand would be?*" Subjects of twelve- to fourteen-year intelligence practically always answer this in the affirmative. Then continue: "*Now, suppose the two hands of the clock were to trade places, so that the large hand takes the place where the small hand was, and the small hand takes the place where the large hand was. What time would it then be?*"

Repeat the test with the hands at 8.10 (10 minutes after 8), and again with the hands at 2.46 (14 minutes before 3).

The subject is not allowed to look at a clock or watch, or to aid himself by drawing, but must work out the problem mentally. As a rule the answer is given within a few seconds or not at all. If an answer is not forthcoming within two minutes the score is failure.

Scoring.—The test is passed if *two of the three* problems are solved within the following range of accuracy: the first solution is considered correct if the answer falls between 4.30 and 4.35, inclusive; the second if the answer falls between 1.40 and 1.45, and the third if the answer falls between 9.10 and 9.15.

Alternative Test: Repeating Seven Digits.—This time, as in year X, only two series are given, one of which must be repeated without error. The two series are: 2–1–8–3–4–3–9 and 9–7–2–8–4–7–5. Note that in none of the tests of

repeating digits is it permissible to warn the subject of the number to be given.

Instructions for "Average Adult"

1. Vocabulary: Sixty-five Definitions.—Procedure and Scoring, as in previous vocabulary tests.

2. Interpretation of Fables (Score 8).—Procedure.— As in year XII, test 6. Use the same fables.

Scoring.—The method of scoring is the same as for XII, but the total score must be 8 points to satisfy the requirements at this level.

3. Differences between Abstract Terms.—Procedure.— Say: *What is the difference between:* (*a*) *Laziness and idleness?* (*b*) *Evolution and revolution?* (*c*) *Poverty and misery?* (*d*) *Character and reputation?*

Scoring.—*Three correct contrasting definitions out of four* are necessary for a pass. It is not sufficient merely to give a correct meaning for each word of a pair; the subject must point out a difference between the two words so as to make a real contrast. For example, if the subject defines *evolution* as a "growth" or "gradual change," and *revolution* as the running of a wheel on its axis, the experimenter should say: "*Yes, but I want you to tell me the difference between evolution and revolution.*" If the contrast is not then forthcoming the response is marked *minus*. The following are sample definitions which may be considered acceptable:

(*a*) *Laziness and idleness.*—"Laziness means you don't want to work; idleness means you are not doing anything just now." "Laziness comes from within; idleness may be forced upon one." The essential contrast, accordingly, is that *laziness refers to unwillingness to work; idleness to the mere fact of inactivity.* This contrast must be expressed, however clumsily.

(*b*) *Evolution and revolution.* "Evolution is a gradual change; revolution is a sudden change." "Evolution is natural development; revolution is sudden upheaval."

The essential distinction, accordingly, is that *evolution means a gradual, natural, or slow change, while revolution means a sudden, forced, or violent change.* Non-contrasting definitions, even when the individual terms are defined correctly, are not satisfactory.

(*c*) *Poverty and misery.* "Poverty is when you are poor; misery means suffering." "Poverty comes from lack of money; misery, from lack of happiness or comfort."

(*d*) *Character and reputation.* "Character is what you are; reputation is what people say about you." "A man has a good character if he would not do evil; but a man may have a good reputation and still have a bad character."

A little practice and a good deal of discrimination are necessary for the correct grading of responses to this test. Subjects are often so clumsy in expression that their responses are anything but clear. It is then necessary to ask them to explain what they mean. Further questioning, however, is not permissible. For uniformity in scoring it is necessary to bear in mind that the definitions given must, in order to be satisfactory, express the essential distinction between the two words.

4. Problem of the Enclosed Boxes.—Procedure.—Show the subject a cardboard box about one inch on a side. Say: "*You see this box; it has two smaller boxes inside of it and each of the smaller boxes contains a little tiny box. How many boxes are there altogether, counting the big one?*" To be sure that the subject understands repeat the statement of the problem: "*First the large box, then two smaller ones, and each of the smaller ones contains a little tiny box.*"

Record the response, and, showing another box, say: "*This box has two smaller boxes inside, and each of the smaller boxes contains two tiny boxes. How many altogether? Remember, first the large box, then two smaller ones, and each smaller one contains two tiny boxes.*"

The third problem, which is given in the same way, states that there are *three* smaller boxes, each of which contains *three* tiny boxes.

In the fourth problem there are *four* smaller *boxes*, each containing *four* tiny boxes.

The problem must be given orally, and the solution must be found without the aid of pencil or paper. Only one half-minute is allowed for each problem. Note that each problem is stated twice.

A correction is permitted, provided it is offered spontaneously and does not seem to be the result of guessing. Guessing can be checked up by asking the subject to explain the solution.

Scoring.—*Three of the four* problems must be solved correctly within the half-minute allotted to each.

5. Repeating Six Digits Reversed.—The series used are: 4–7–1–9–5–2; 5–8–3–2–9–4; and 7–5–2–6–3–8.

Procedure and Scoring, as in year VII, alternative 2.

6. Using a Code.—Procedure.—Show the subject the code given on the printed card. Say: "*See these diagrams here. Look and you will see that they contain all the letters of the alphabet. Now, examine the arrangement of the letters. They go* (pointing) *a b c, d e f, g h i, j k l, m n o, p q r, s t u v, w x y z. You see the letters in the first two diagrams are arranged in the up-and-down order* (pointing again), *and the letters in the other two diagrams run in just the opposite way from the hands of a clock* (pointing). *Look again and you will see that the second diagram is drawn just like the first, except that each letter has a dot with it, and that the last diagram is like the third except that here, also, each letter has a dot. Now, all of this represents a code; that is, a secret language. It is a real code, one that was used in the Civil War for sending secret messages. This is the way it works: we draw the lines which hold a letter, but leave out the letter. Here, for example, is the way we would write 'spy.'*" Then write the word *spy*, pointing out carefully where each letter comes from, and emphasizing the fact that the dot must be used in addition to the lines in writing any letter in the second or the fourth diagram. Illustrate also with *war.*

Then add: *"I am going to have you write something for me; remember now, how the letters go, first* (pointing, as before) *a b c, d e f, g h i, then j k l, m n o, p q r, then s t u v, then w x y z. And don't forget the dots for the letters in this diagram and this one"* (pointing). At this point, take away the diagrams and tell the subject to write the words *come quickly*. Say nothing about hurrying.

The subject is given a pencil, but is allowed to draw only the symbols for the words *come quickly*. He is not permitted to reproduce the entire code and then to copy the code letters from his reproduction.

Scoring.—The test is passed if the words are written in *six minutes and without more than two errors*. Omission of a dot counts as only a half error.

Alternative Test 1: Repeating Twenty-eight Syllables.—Procedure.—Exactly as in VI, 6. Emphasize that the sentence must be repeated without a single change of any sort. Get attention before giving each sentence.

Scoring.—Passed *if one sentence is repeated without a single error*. In VI and X we scored the response as satisfactory if one sentence was repeated without error, or if two were repeated with not more than one error each.

Alternative Test 2: Comprehension of Physical Relations.—(*a*) *Problem regarding the path of a cannon ball.*

Procedure.—Draw on a piece of paper a horizontal line 6 or 8 inches long. Above it, an inch or two, draw a short horizontal line about an inch long and parallel to the first. Tell the subject that the long line represents the perfectly level ground of a field, and that the short line represents a cannon. Explain that the cannon is "*pointed horizontally* (*on a level*) *and is fired across this perfectly level field.*" After it is clear that these conditions of the problem are comprehended, we add: "*Now, suppose that this cannon is fired off and that the ball comes to the ground at this point here* (pointing to the farther end of the line which represents the field). *Take this pencil and draw a line which will show what path the cannon ball will take from*

the time it leaves the mouth of the cannon till it strikes the ground."

Scoring.—There are four types of response: (1) A straight diagonal line is drawn from the cannon's mouth to the point where the ball strikes. (2) A straight line is drawn from the cannon's mouth running horizontally until almost directly over the goal, at which point the line drops almost or quite vertically. (3) The path from the cannon's mouth first rises considerably from the horizontal, at an angle perhaps of between ten to forty-five degrees, and finally describes a gradual curve downward to the goal. (4) The line begins almost on a level and drops more rapidly toward the end of its course.

Only the last is satisfactory. Of course, nothing like a mathematically accurate solution of the problem is expected. It is sufficient if the response belongs to the fourth type above instead of being absurd, as the other types described are. Anyone who has ever thrown stones should have the data for such an approximate solution. Not a day of schooling is necessary.

(*b*) *Problem as to the weight of a fish in water.*

Procedure.—Say to the subject: "*You know, of course, that water holds up a fish that is placed in it. Well, here is a problem. Suppose we have a bucket which is partly full of water. We place the bucket on the scales and find that with the water in it it weighs exactly* 45 *pounds. Then we put a* 5-*pound fish into the bucket of water. Now, what will the whole thing weigh?* "

Scoring.—Many subjects even as low as nine- or ten-year intelligence will answer promptly, "Why, 45 pounds and 5 pounds makes 50 pounds, of course." But this is not sufficient. We proceed to ask, with serious demeanor: "*How can this be correct, since the water itself holds up the fish?* " The young subject who has answered so glibly now laughs sheepishly and apologizes for his error, saying that he answered without thinking, etc. This response is scored failure without further questioning.

Others subjects, mostly above the fourteen-year level, adhere to the answer "50 pounds," however strongly we urge the argument about the water holding up the fish. In response to our question, "*How can that be the case?*" it is sufficient if the subject replies that "The weight is there just the same; the scales have to hold up the bucket and the bucket has to hold up the water," or words to that effect. Only some such response as this is satisfactory. If the subject keeps changing his answer or says that he *thinks* the weight would be 50 pounds, but is not certain, the score is failure.

(*c*) *Difficulty of hitting a distant mark:*

Procedure.—Say to the subject: "*You know, do you not, what it means when they say a gun 'carries* 100 *yards'? It means that the bullet goes that far before it drops to amount to anything.*" All boys and most girls more than a dozen years old understand this readily. If the subject does not understand, we explain again what it means for a gun "to carry" a given distance. When this part is clear, we proceed as follows: "*Now, suppose a man is shooting at a mark about the size of a quart can. His rifle carries perfectly more than* 100 *yards. With such a gun is it any harder to hit the mark at* 100 *yards than it is at* 50 *yards?*" After the response is given, we ask the subject to explain.

Scoring.—Simply to say that it would be easier at 50 yards is not sufficient, nor can we pass the response which merely states that it is "easier to aim" at 50 yards. The correct principle must be given, one which shows the subject has appreciated the fact that a small deviation from the "bull's-eye" at 50 yards, due to incorrect aim, becomes a larger deviation at 100 yards. However, the subject is not required to know that the deviation at 100 yards is exactly twice as great as at 50 yards. A certain amount of questioning is often necessary before we can decide whether the subject has the correct principle in mind.

Scoring the Entire Test.—*Two of the three problems* must be solved in such a way as to satisfy the requirements above set forth.

Instructions for "Superior Adult"

1. Vocabulary: Seventy-five Definitions.—Procedure and Scoring, as in previous vocabulary tests.

2. Paper-cutting Test.—Procedure.—Take a piece of paper about 6 inches square and say: "*Watch carefully what I do. See, I fold the paper this way* (folding it once over in the middle), *then I fold it this way* (folding it again in the middle, but at right angles to the first fold). *Now I will cut out a notch right here*" (indicating). At this point take scissors and cut out a small noteh from the middle of the side whieh presents but one edge. Throw the fragment which has been cut out into the waste-basket or under the table. Leave the folded paper exposed to view, but pressed flat against the table. Then give the subject a pencil and a second sheet of paper like the one already used and say: "*Take this piece of paper and make a drawing to show how the other sheet of paper would look if it were unfolded. Draw lines to show the creases in the paper and show what rcsults from the cutting.*"

The subject is not permitted to fold the second sheet, but must solve the problem by the imagination unaided.

Note that we do not say, "*Draw the holes,*" as this would inform the subjeet that more than one hole is expected.

Scoring.—The test is passed *if the creases in the paper are properly represented, if the holes are drawn in the correct number, and if they are located correctly,* that is, both on the same crease and each about halfway between the center of the paper and the side. The shape of the holes is disregarded.

Failure may be due to error as regards the creases or the number and location of the holes, or it may involve any combination of the above errors.

3. Repeating Eight Digits.—Procedure and Scoring, the same as in previous tests with digits. The series

used are: 7-2-5-3-4-8-9-6; 4-9-8-5-3-7-6-2; and 8-3-7-9-5-4-8-2.

Guard against rhythm and grouping in reading the digits and do not give warning as to the number to be given.

4. Repeating Thoughts of Passage.—Procedure.— Say "*I am going to read a little selection of about six or eight lines. When I am through I will ask you to repeat as much of it as you can. It doesn't make any difference whether you remember the exact words or not, but you must listen carefully so that you can tell me everything it says.*" Then read the selections, pausing after each for the subject's report, which should be recorded *verbatim.*

Sometimes the subject hesitates to begin, thinking, in spite of our wording of the instructions, that a perfect reproduction is expected. Others fall into the opposite misunderstanding and think that they are prohibited from using the words of the text and must give the thought entirely in their own language. In cases of hesitation we should urge the subject a little and remind him that he is to express the thought of the selection in whatever way he prefers; that the main thing is to tell what the selection says.

Scoring.—The test is passed if the subject is able to repeat in reasonably consecutive order the main thoughts of at least one of the selections. Neither elegance of expression nor *verbatim* repetition is expected. We merely want to know whether the leading thoughts in the selection have been grasped and remembered.

5. Repeating Seven Digits Reversed.—Procedure and Scoring, the same as in previous tests of this kind. The series are: 4-1-6-2-5-9-3; 3-8-2-6-4-7-5; and 9-4-5-2-8-3-7.

6. Ingenuity Test.—Procedure.—Problem *a* is stated as follows: *A mother sent her boy to the river and told him to bring back exactly* 7 *pints of water. She gave him a* 3-*pint vessel and a* 5-*pint vessel. Show me how the boy can measure out exactly* 7 *pints of water, using nothing but these two vessels and not guessing at the amount. You should begin by filling*

the 5-pint vessel first. Remember, you have a 3-pint vessel and a 5-pint vessel and you must bring back exactly 7 pints.

The problem is given orally, but may be repeated if necessary.

The subject is not allowed pencil or paper and is requested to give his solution orally as he works it out. It is then possible to make a complete record of the method employed.

The subject is likely to resort to some such method as to " fill the 3-pint vessel two thirds full," or, " I would mark the inside of the 5-pint vessel so as to show where 4 pints come to," etc. We inform the subject that such a method is not allowable; that this would be guessing, since he could not be sure when the 3-pint vessel was two thirds full (or whether he had marked off his 5-pint vessel accurately). Tell him he must *measure* out the water without any guess-work. Explain also, that it is a fair problem, not a " catch."

Say nothing about pouring from one vessel to another, but if the subject asks whether this is permissible the answer is " yes."

The time limit for each problem is five minutes. If the subject fails on the first problem, we explain the solution in full and then proceed to the next.

The second problem is like the first, except that a 5-pint vessel and a 7-pint vessel are given, to get 8 pints, the subject being told to begin by filling the 5-pint vessel.

In the third problem 4 and 9 are given, to get 7, the instruction being to " begin by filling the 4-pint vessel."

Note that in each problem we instruct the subject how to begin. This is necessary in order to secure uniformity of conditions. It is possible to solve all of the problems by beginning with either of the two vessels, but the solution is made very much more difficult if we begin in the direction opposite from that recommended.

Give no further aid. It is necessary to refrain from comment of every kind.

Scoring.—*Two of the three* problems must be solved correctly within five minutes allotted to each.

APPENDIX VI

FREE ASSOCIATION TEST (KENT-ROSANOFF)[1]

Instructions.—One uses a sheet with the stimulus words printed on it and with space opposite each stimulus word for the reaction.[2] In a room reasonably free from distracting influences the subject is seated at a distance from the experimenter so as to be unable to see either the printed stimulus words or the reactions as they are recorded. He is instructed to respond to each stimulus word with the first word that comes to his mind other than the stimulus word itself or a mere different grammatical form of it, to respond with one word only and not with a compound word or a sentence or phrase. A few stimulus words not on the list may be given for preliminary practice, the reactions not being recorded; and when it appears that the subject understands the instructions the test may be begun. Should the subject in the course of the test give an unacceptable reaction, it is not put

[1] G. H. Kent and A. J. Rosanoff. *A Study of Association in Insanity.* Amer. Journ. of Insanity, July and Oct., 1910.—R. S. Woodworth and F. L. Wells. *Association Tests.* Psychol. Monogr., No. 57, 1911.—F. L. Wells. *The Question of Associotion Types.* Psychol. Review, July, 1912.—F. C. Eastman and A. J. Rosanoff. *Association in Feeble-Minded and Delinquent Children.* Amer. Journ. of Ins., July, 1912.—Isabel R. Rosanoff and A. J. Rosanoff. *A Study of Association in Children.* Psychol. Review, Jan., 1913.—E. K. Strong, Jr. *A Comparison between Experimental Data and Clinical Results in Manic-Depressive Insanity.* Amer. Journ. of Psychol., Jan., 1913.—Margaret Otis. *A Study of Association in Defectives.* Journ. of Educ. Psychol., May, 1915.—Ida Mitchell, Isabel R. Rosanoff, and A. J. Rosanoff. *A Study of Association in Negro Children.* Psychol. Review, Sept., 1919.

[2] Printed forms for this test may be purchased in packages of 25 from The Morningside Press, 417 West 118th Street, New York.

down, but the pertinent instruction is repeated, the test continued, and at the end all the stimulus words thus improperly reacted to and therefore remaining without a recorded reaction are given over again.

In cases in which it is desired to use the association test for the purpose of detecting pathogenic subconscious ideas or complexes that may be suspected to exist, the examiner's familiarity with the case will suggest to him special stimulus words adapted to the particular case; these stimulus words may be given together with those regularly employed, being introduced, say, after every fifth or every tenth one. In such cases it is also advisable to record in each instance the reaction time in fifths of a second, taken by means of a stop watch; subconscious ideas or complexes are said to be indicated either by abnormal types of reaction or by instances of reaction time much above the average for the individual.

Classification of Reactions.—This test has been applied to one thousand normal subjects, and all reactions thus obtained arranged in frequency tables for all the stimulus words. These frequency tables are reprinted below.[1]

In the examination of a test record obtained by this method the first step is to compare it with the frequency tables and thereby distinguish the *common* reactions, which are to be found in the tables and which are for the most part normal, from *individual* reactions, which are not to be found in the tables and which include the great majority of those that are of pathological significance.

For the sake of accuracy, any reaction word which is not found in the table in its identical form, but which is a grammatical variant of a word found there, is classed as *doubtful*.

From amongst both common and individual reactions a fairly definite group can be separated out, the *non-specific*

[1] Similar tables have been compiled for children: H. Woodrow and F. Lowell. *Children's Association Frequency Tables.* Psychological Monographs, No. 97, Princeton, N. J., 1916.

reactions. In this group are placed words which are so widely applicable as to serve as more or less appropriate reactions to almost any of the stimulus words. In the standardized procedure any of the following words, occurring as a response to any stimulus word, is classed as non-specific: *article, articles, bad, beautiful, beauty, fine, good, goodness, great, happiness, happy, large, man, necessary, necessity, nice, object (noun), people, person, pleasant, pleasantness, pleasing, pleasure, pretty, small, thinking, thought, thoughts, unnecessary, unpleasant, use, used, useful, usefulness, useless, uselessness, uses, using, woman, work.*

Inasmuch as the frequency tables do not exhaust all normal possibilities of word reaction, a certain number of reactions which are essentially *normal* are to be found among individual reactions. In order to separate these from the pathological reactions an appendix to the frequency tables has been compiled, consisting mainly of specific definitions of groups of words which, occurring as individual reactions, are to be counted as normal. (See p. 603.)

Derivatives of Stimulus Words.—Under this heading is classed any reaction which is a grammatical variant or derivative of the stimulus word: *eating—eatables, short—shortness, sweet—sweetened.*

Sound Reactions.—In the standardized procedure a reaction is placed under this heading when 50 per cent of the sounds of the shorter word of the pair are identical with sounds of the longer word and are ranged in the same order.

Among sound reactions are occasionally found *neologisms;* for these a separate heading is provided.

Word Complements.—Here is included any reaction which, added to the stimulus word, forms a word, a proper name, or a compound word.

Particles of Speech.—Under this heading are included articles, numerals, pronouns, auxiliary verbs, adverbs of time, place and degree, conjunctions, prepositions, and interjections.

The phenomenon of *perseveration* occurs in cases in which there is abnormal lack of mobility of attention. The names of the different types of reactions attributable to perseveration are given below in the classification table and are sufficiently descriptive; we shall refer here only to those which require further definition.

Association to Preceding Stimulus.—Here is placed any individual reaction that is shown by the frequency tables to be related to the stimulus preceding the one in question.

Association to Preceding Reaction.—If either the reaction in question or the preceding reaction happens to be one of the stimulus words on the list, and a relationship between the two be found to exist by reference to the frequency tables, the reaction in question is classified under this heading.

In cases in which neither the reaction in question nor the preceding reaction happens to be one of the stimulus words, but a relationship between them may be judged to exist without considerable doubt, the reaction in question is also classed here. Example: *priest—father, ocean—mother.* The latter is an individual reaction; neither the word *father* nor *mother* is among the stimulus words; but the association between the words *father* and *mother* may be judged to exist without considerable doubt; therefore in this case *mother* is classed as an *association to preceding reaction.*

Repetition of Previous Stimulus.—Here is placed any reaction which is a repetition of any previous stimulus from amongst the ten next preceding, at the same time placing *repetition of preceding stimulus* under a separate heading.

Neologisms.—Here are placed the newly coined words, so commonly given by psychotic subjects, excepting such as possess a sound relationship to the stimulus word, for which, as already stated, a special place in the classification has been provided.

Unclassified.—Into this group fall over one third of all individual reactions, it having been found impossible to find objective criteria for their more definite differentiation.

Order of Preference.—It happens not infrequently that a reaction presents features which render it assignable under two or more headings in the classification. In the standard procedure the following order of preference is used for guidance in such cases:

Common Reactions:

1. Specific.
2. Non-specific.
3. *Doubtful Reactions.*

Individual Reactions:

4. Sound reactions (neologisms).
5. Neologisms without sound relation.
6. Repetition of preceding reaction.
7. Reaction repeated five times.
8. Repetition of preceding stimulus.
9. Derivatives.
10. Non-specific reactions.
11. Sound reactions (words).
12. Word complements.
13. Particles of speech.
14. Association to preceding stimulus.
15. Association to preceding reaction (by frequency tables).
16. Repetition of previous reaction.
17. Repetition of previous stimulus.
18. Normal (by appendix).
19. Association to preceding reaction (without frequency tables).
20. Unclassified.

In Tables 18, 19, and 20 are given results obtained and standards established by means of the Kent-Rosanoff test applied to normal, insane, and feeble-minded subjects, and to white and negro children of various ages. The findings in any case may be evaluated by comparison with these tables.

TABLE 18

Subjects.	Common Reactions.		Doubtful Reactions.	Individual Reactions.	Failures of Reaction.
	Specific. %	Non-specific. %	%	%	%
1000 normal adults........	85.5	6.2	1.5	6.8	——
247 insane adults..........	66.4	4.3	2.5	26.8	——
253 defective children aged over 9 yrs..............	75.2	8.2	2.1	13.0	1.5
125 normal white children 11–15 yrs..............	82.0	7.2	1.6	8.6	0.6
175 normal white children 4–10 yrs................	62.7	4.2	3.2	18.8	11.1
125 normal negro children 11–15 yrs..............	75.3	7.2	2.5	14.9	0.1
175 normal negro children 4–10 yrs................	54.1	3.5	2.5	33.2	6.7

TABLE 19

Types of Reaction.[1]	86 Normal Adults. %	300 White Children. %	300 Negro Children. %
Normal (by appendix)............	41.8	20.0	12.3
Derivatives of stimulus words......	0.3	0.1	5.7
Partial dissociation [2]...............	8.0	11.1	16.7
Perseveration [3]..................	6.1	27.8	23.0
Neologisms (without sound relation).	——	0.6	0.3
Unclassified.....................	43.8	40.4	42.0

[1] The Kent-Rosanoff classification was used.

[2] Under this heading are included the following varieties of reactions: non-specific, sound (words and neologisms), word complements, and particles of speech.

[3] Under this heading are included the following varieties of reactions: association to preceding stimulus, association to preceding reaction, repetition of preceding stimulus, repetition of previous stimulus, repetition of preceding reaction, repetition of previous reaction, and reaction repeated five times.

TABLE 20

Group Ages in Years.	Common Reactions.				Doubtful Reactions.		Individual Reactions.		Failures of Reaction.	
	Specific.		Non-specific.							
	White %	Negro %	White %	Negro %	White %	Negro %	White %	Negro %	White %	Negro %
4.....	40.4	37.5	1.1	1.0	3.8	2.3	25.3	40.9	29.4	18.4
5.....	55.1	41.5	2.0	1.4	4.4	1.8	21.4	37.4	17.1	17.9
6.....	62.2	52.1	2.7	2.2	3.2	2.6	18.6	37.6	13.3	5.5
7.....	64.9	56.0	4.0	3.7	3.5	2.1	20.0	35.1	7.6	3.3
8.....	68.4	59.3	5.8	5.4	3.1	3.2	18.0	31.0	4.7	1.2
9.....	75.1	62.3	5.5	6.5	1.7	2.6	14.2	27.7	3.5	0.9
10.....	72.9	70.0	8.4	4.4	2.3	2.7	14.3	23.4	2.1	0.1
11.....	82.0	74.8	7.1	7.0	1.7	2.6	8.6	15.5	0.6	0.1
12.....	83.8	74.2	6.6	7.5	1.3	2.4	7.6	15.6	0.7	0.2
13.....	81.1	74.2	8.4	7.2	1.8	2.6	8.5	15.8	0.2	0.2
14.....	84.1	77.2	6.3	7.8	1.4	2.6	7.7	12.4	0.5	0.1
15.....	78.7	76.3	7.6	6.2	2.0	2.2	10.8	15.2	0.9	0.1

THE FREQUENCY TABLES.

1. TABLE

1 accommodation
8 article
1 articles

1 basket
9 bench
14 board
7 book
5 books
1 boy
1 bread
2 breakfast
2 broad
1 brown
1 butter

2 cards
1 celery
1 center
267 chair
7 chairs
1 chemical
57 cloth
1 cockroaches
1 comfort
17 cover
1 cutlery

11 desk

2 dine
4 dining
26 dinner
5 dish
40 dishes
1 dissection
1 dog

63 eat
1 eatables
34 eating

1 ferns
1 fête
5 flat
7 floor
29 food
1 fork
1 form
75 furniture

1 glass

9 hard
1 hat
2 home
8 house

1 ink

1 kitchen

1 lamp
4 large
1 leaf
1 leaves
1 library
13 leg
10 legs
2 linen
1 long
2 low

1 Mabel
2 mahogany
1 mat
6 meal
4 meals
2 meat
1 mess

2 nails
1 napkin
1 number

1 oak
1 object
1 old

1 operating
2 ornament

1 parlor
1 pitcher
4 plate
1 plates
1 plateau
1 polished

1 refreshments
3 rest
3 room
10 round

1 school
1 serviceable
2 set
1 shiny
3 sit
2 sitting
1 slab
1 smooth
1 soup
1 spiritualism
6 spoon
2 spread
9 square

1 stable
86 stand
3 stool
1 straight
1 strong
1 supper

1 tablecloth
1 tea
1 timber
2 top
1 typewriter

2 use
8 useful
1 utensil

2 victuals

1 wagon
1 whist
1 white
1 wire
76 wood
1 wooden
2 work
1 working
2 write
6 writing

2. DARK

6 afraid

1 baby
1 bad
1 barks
76 black
2 blackness
1 blank
2 blind
2 blindness
5 blue
1 board
1 boat
15 bright
4 brightness
4 brown

1 candle
1 cart
2 cat
1 cell
6 cellar
1 close
1 closet
2 cloud
2 clouds
8 cloudy

2 cold
28 color
1 colored
1 colorless
1 coon
1 curly

1 day
1 daylight
1 dead
1 denseness
3 dim
3 dimness
2 dingy
3 dismal
1 dog
1 door
1 dreary
4 dress
5 dungeon
1 dusk
1 dusky

4 evening
1 eye
2 eyes

2 fair
6 fear
1 fearful
1 fearsome
2 fright

1 ghost
1 ghosts
6 gloom
11 gloomy
1 gray
1 green
1 ground

5 hair
1 hall
1 hell
1 hole
3 horse
2 house

1 illumination
2 invisible

1 lamp
1 lantern

427 light
1 lonely
1 lonesome
1 lonesomeness

1 mahogany
4 man
1 mice
1 midnight
6 moon
1 moonlight
1 mysterious

1 nice
221 night

1 oblivion
1 obscure

1 parlor
1 prison

5 red
3 rest
22 room

1 scare
1 shades
2 shadow
1 shadows
1 sky
1 sleep
1 sleeping
1 space
1 starry
2 stars
1 stillness
1 storm
1 stumbling
1 subject
1 sunlight

1 thunder
1 tree
1 twilight

1 unseen

1 walk
3 weather
9 white
1 woods

3. MUSIC

1 accordion
3 air
1 amuse
10 amusement
7 art
1 attention
1 attraction

6 band
1 bassviol
7 beautiful
2 beauty
7 Beethoven
1 bell
1 bird
1 birds
1 book
2 books
2 box
1 brightness

1 captivating
1 cats
1 charm
1 charms
2 charming
2 cheerful
2 cheerfulness
1 Chopin
1 chord
1 chords
1 clarinette
1 classic
2 classical
2 composer
1 company
2 concert
1 conductor

17 dance
1 dances
15 dancing
1 delight
2 delightful
3 discord
1 drama

3 ear
1 ecstasy
1 elevating
1 enchantment
1 enjoyable
1 enjoyed
13 enjoyment
6 entertaining
8 entertainment
1 entrancing

1 feeling
1 fiddle
2 fine
1 flowers
1 flute
1 fun

2 gaiety
1 gay
1 genius
2 girl
1 gladness
1 Goethe
8 good
1 guitar

2 hall
5 happiness
2 happy

1 harmonious
45 harmony
1 hear
2 heaven
1 hurdygurdy
1 hymn

1 idealism
21 instrument
6 instruments
1 instrumental

1 jolly
11 joy
1 joyful

1 lesson
1 light
1 line
1 liveliness
1 lonely
1 loud
2 love

1 man
1 meditation
24 melody
1 Mendelssohn
1 Merry Widow
1 Mozart
1 Mr. B.
1 Mrs. E.
8 musician
1 mute

6 nice
1 nocturne
16 noise

1 noisy
2 note
17 notes

6 opera
6 orchestra
6 organ

2 paper
1 pastime
130 piano
2 pianola
1 pitch
7 play
8 playing
10 pleasant
1 pleasantness
5 pleasing
81 pleasure
1 poem
4 poetry
1 practice
4 pretty
1 pupils

1 quiet

1 rack
1 racket
1 rhyme
2 roll
1 room

2 sadness
1 scale
2 Schubert
1 score
5 sheet
1 sheets

12 sing
1 singer
43 singing
1 soft
1 softness
1 solemn
68 song
6 songs
2 soothing
95 sound
2 sounds
2 stool
1 strain
2 strains
1 string
2 study
47 sweet
6 sweetness
4 symphony

2 talent
6 teacher
1 teaching
1 thought
2 time
8 tone
1 town
2 tune

21 violin
2 voice

8 Wagner
1 wavy
1 window
1 words
1 worship

1 Yankee Doodle

4. SICKNESS

1 affliction
1 age
8 ailing
2 ailment
1 air
1 anxiety
8 appendicitis
1 aunt

1 baby
15 bad
54 bed
1 Bertha
1 better
1 body
1 business

1 calamity
1 care
2 child
1 cold
1 condition
8 consumption
2 contagious
1 convalescence
2 convalescing
8 cure

1 danger
115 death
1 dietary
8 diphtheria
1 disability

2 disabled
3 discomfort
29 disease
4 distress
62 doctor
1 dread
1 dreariness

1 enjoyed
1 ether
1 exhaustion

1 family
3 father
1 fear
4 feeble
1 feel
1 feeling
9 fever
1 fevers
1 fracture
1 fright

1 gloom
1 gravel
2 grief
1 grunting

2 hard
1 hatefulness
5 headache
142 health
4 healthy

2 home
1 horrible
9 hospital

48 ill
71 illness
1 incompetence
1 inconvenience
1 indisposition
1 infirmary
1 insanity
2 invalid

1 K.

1 low
1 lying

2 malady
1 man
8 measles
1 medication
29 medicine
1 melancholy
1 mine
3 misery
3 misfortune
3 mother

2 nervousness
1 neuralgia
15 nurse
2 nursing

1 operation
1 oranges

36 pain
1 painful
2 pale
7 patient
1 patients
1 people
1 person
7 physician
1 pill
1 pills
1 plague
1 pleasantness
5 pneumonia
1 poverty

1 quiet
1 quietness

8 recovery
1 relapsing
1 rheumatism
1 room

7 sad
9 sadness
3 serious
4 severe
1 sigh
1 sore
24 sorrow

2 sorry
1 stomach
2 strength
1 suffer
12 suffering
1 summer
2 sympathy

1 terror
1 together
20 trouble
1 trying
6 typhoid

2 uncomfortable
1 unhappiness
1 unhappy
4 unhealthy
5 unpleasant
2 unpleasantness
11 unwell

1 want
1 weak
11 weakness
2 wealth
1 weariness
1 weary
40 well
1 white
1 worried
1 worriment

5. MAN

2 adult
1 affection
1 age
1 alive
12 animal
1 animals
1 animate
2 appearance

1 baby
2 bad
1 beard
2 beast
19 being
8 biped
1 blond
8 body
44 boy
1 brain
1 bright
1 brightness
8 brother
1 brotherhood
1 brute
1 bum
6 business

8 cane
1 certain
2 Charles
10 child
2 children
1 Christian
1 clergyman
7 clothes
2 clothing
8 coat
1 comfort
1 companion
1 company
1 coon
1 crank
8 creature
1 cross

1 devil
2 doctor
1 dress

1 educator
1 existence

1 fakir
1 false
1 family
15 father
3 female
2 flesh
2 form
1 fraud
1 Fred
2 friend

1 gentle
7 gentleman
6 girl
1 glacier
10 good
1 greatness
1 grown
1 growth

1 hair
7 hat
2 help
1 home
1 homely
1 horrible
4 horse
1 house
22 human
1 humanity
4 husband

1 individual
1 insane
1 institution
1 intellectual
1 intelligent

1 janitor
1 Joe

1 labor
2 laborer
7 lady
11 large
4 life
1 light
1 limb
2 living
1 lord
1 love

1 machine
1 maiden
90 male
1 mammal
1 manhood
5 mankind
1 manliness
2 manly
1 marriage
1 married
6 masculine
1 mason
1 mind
1 might
1 minister
1 minor
1 misery
1 money
1 monkey
1 Mr. D.
1 Mr. H.
1 Mr. N.
8 Mr. S.
1 muscular

1 N.
1 nature
1 Ned
1 nice
8 noble
1 nuisance

1 out

1 papa
1 passion
2 people
30 person
1 pleasure
2 policeman
1 politician
5 power
1 professor
1 prosperity
1 provider

1 Roosevelt
1 ruler

1 self
4 sex
1 shirt
1 shoes
1 short
1 smoking
1 stern
1 stout
1 street
32 strength
8 strong
1 sweetheart

1 Taft
12 tall
1 thought
6 trousers
1 true

1 unfeminine
1 use

1 V.
1 voter

1 walk
1 wedding
1 whiskers
5 wife
1 wise
394 woman
17 work
1 works
1 worker
8 working

2 young

6. DEEP

8 abyss
1 altitude
1 around

8 below
1 beneath
1 black
3 blue
1 bottom
1 bottomless
1 bowl
1 breath
2 broad
1 brooding
1 brook

2 cave
1 Cayuga
1 chair
2 chasm
1 cellar
1 classic
1 clear
1 cliff

8 danger
6 dangerous
23 dark
4 darkness
1 dense
31 depth
1 depths
1 diameter
1 dig
8 distance
3 ditch
1 doleful
27 down
1 dread

1 earth
1 extension

2 fall
3 falling
3 far
5 fathomless
1 fear
1 full

1 gloomy
1 good
1 gorge
1 great
1 ground
1 heavy
5 height
37 high
32 hole
13 hollow

3 large
8 length
2 level
4 light
18 long
51 low

2 measure
1 mighty
1 mind
4 mine

3 narrow

93 ocean
1 organ

1 philosophy
1 pit
1 pond
1 pool
1 precipice
4 profound

1 ravine
1 reaching
13 river
1 rocks

1 safety
1 scare
90 sea
1 sewer
1 shade
1 shady
180 shallow
1 sharp
1 ship
1 short
1 sincere
2 sink
1 sleep
1 smooth
1 sorrow
2 sound
6 space
2 spacious
7 steep
1 story
1 strong
1 study
1 sunken
1 surface
1 swimming

1 thick
1 thickness
1 thin
2 thinking
14 thought
2 thoughts
1 tranquil
1 trench

1 under

1 valley
2 vast

1 wading
134 water
44 well
1 wet
12 wide
2 width

7. SOFT

1 apple

7 baby
2 ball
1 beautiful
12 bed
1 boiled
1 brain
4 bread
1 breeze
12 butter

1 cake
1 candy
1 care
1 carpet
1 cat
1 cement
1 clay
1 clean
3 cloth
1 clothes
2 coal
1 cold
2 color
2 comfort
6 comfortable
1 comply
1 consistency
28 cotton
1 crabs
2 cream
1 creeping
25 cushion

1 dark
1 dough
6 down
8 downy
1 dress
1 drink

7 earth
1 ease
34 easy
4 egg
2 eggs
1 elastic
1 eyes

2 feather
24 feathers
1 feathery
1 feel
8 feeling
1 felt
5 fine
1 firm
3 flabby
1 fleece
1 flesh
7 flexible
1 floor
1 fluffy
2 food
1 foolish
1 form
3 fruit
1 fun
4 fur

3 gentle
1 girl
1 glove
3 good
1 grasp
1 grass
3 ground
1 gum

8 hair
3 hand
1 hands
365 hard
1 harsh
1 hazy
1 head

1 idiot

1 jelly

2 kitten

1 large
8 light
1 lightly
2 liquid
2 loose
5 loud
5 low

1 maple
1 marshes
1 medium
11 mellow
1 membrane
2 mild
1 moist
2 moss
15 mud
10 mush
1 mushing
12 mushy
4 music

4 nice

1 palatable
2 peach
2 pear
53 pillow
2 pillows
8 pliable
2 plush
4 pudding
4 putty

1 quality
8 quiet

3 rubber

1 sand
1 satisfactory
1 seat
10 silk
1 skin
2 slow
1 slushy
27 smooth
3 snap
7 snow
6 soap
1 soup
22 sponge
1 sponges
8 spongy
1 squash
1 sticky
1 strong
1 substance
8 sweet
1 sweetness

8 tender
1 texture
1 timid
1 tomatoes
4 touch

1 uncooked

16 velvet
2 voice

1 wadding
1 warm
8 water
1 watery
1 wax
3 wet
3 white
8 wool
1 woolen

5 yielding

8. EATING

1 abstain
1 abstinence
2 action
28 appetite
4 apple
6 apples
1 assimilation

1 biting
48 bread
7 breakfast
1 butter

4 cake
8 candy
1 Chacona's
1 chew
27 chewing
3 chicken
1 coffee
1 Commons
4 consuming
8 cooking
2 cream

1 devour
2 devouring
2 diet
1 diets
1 digest
7 digesting
10 digestion
2 dine
1 dining
81 dinner
6 drink
166 drinking
1 dyspepsia

1 enjoyable
1 enjoying
2 enjoyment
1 enough
1 etiquette

3 fast
5 fasting
1 fattening
2 feasting
1 feed
6 feeding
2 filling
1 finishing
3 fish
1 flavor
1 flesh
170 food
2 fork
1 forks
8 fruit
4 full

1 gluttonish
23 good
1 gormandizer
1 gratifying

8 habit
9 health
1 healthful
1 heartily
1 hearty
2 hot
1 house
19 hunger
44 hungry

2 ice-cream
4 indigestion

1 knives

1 lemons
2 life
4 live
6 living
1 lobster
1 lobsters
8 lunch

1 masticate
11 masticating
5 mastication
1 matter
4 meal
10 meals
11 meat
1 meeting
1 mild
1 milk
1 more
1 motion
2 mouth
1 movement
1 much
1 myself

4 necessary
7 necessity
3 nice
1 nourish
2 nourishing
11 nourishment

1 olives
1 oranges

2 palatable
3 people
3 pie
7 pleasant
1 pleasantness
10 pleasure
1 plenty
1 poor
1 potato
2 potatoes
1 provisions
1 pudding

1 quick
1 quickly

2 refreshing
1 refreshment
1 Reisenweber
1 relief
2 relish
2 resting
1 room

1 sandwich
12 satisfaction
4 satisfied
1 satisfy
5 satisfying
1 sick
1 sit
1 sitting
1 sleep
17 sleeping
2 slow
1 slowly
2 soup
4 starving
2 steak
2 stomach
1 strawberries
2 strength
1 substance
2 sufficient
1 sugar
1 surfeiting
1 sustaining
2 sustenance
6 swallow
5 swallowing

21 table
1 talking
7 taste
2 tasting
3 teeth
1 thinking
1 throat
1 tongue

1 use
1 utensils

8 vegetable
8 vegetables
4 victuals

2 want
1 water
1 watermelon
2 well
1 work

9. MOUNTAIN

1 abrasion
4 Adirondacks
2 air
3 Alleghany
6 Alps
2 altitude
1 attractive
1 automobile

1 Bald
1 beautiful
2 beauty
2 big
1 Blanc
1 Bluff
1 Breckenridge

1 camping
8 Catskills
2 cliff
1 cliffs
1 Clifton
9 climb
27 climbing
1 close
3 clouds
1 cone
5 country
1 crevice

1 descend
2 descending
1 desert
1 dirt
1 distance
1 ditch

3 earth
9 elevation

1 fear
1 field
1 Flashman
1 foliage
1 fountain

1 Galeton
1 geography
1 grand
3 grandeur
1 granite
1 grass
1 great
4 green
1 ground

1 heath
73 height
2 heights
246 high
1 highlands
2 highness
184 hill
32 hills
2 hilltop
1 hilltops
2 hilly
1 Himalaya
5 hollow
1 Holyoke
1 home
1 horse
1 Hudson
2 huge

1 impressive
1 incline
1 island

1 Kipling
1 knoll

8 lake
6 land
1 landscape
4 large
1 level
1 lofty
2 low
1 lowland

1 Monodonack
1 mound
1 Mount Ivy
1 Mount Kearsarge
1 Mount McKinley
1 Mount Pleasant
1 Mount Shasta
1 Mount Wilson

2 object
1 Owl's Head

16 peak
1 peaks
1 pictures
1 Pike's Peak
1 pines
11 plain
1 plateaus
3 pleasure
1 pointed

1 railway
3 range
1 ranges
8 river
10 rock
6 Rockies
18 rocks
5 rocky
1 rough

1 scene
3 scenery
1 sea
1 seas
1 seashore
1 shadows
1 shooting
1 size
2 sky
1 slope
10 snow
12 steep
1 steepness
2 stone
1 stones
2 stream
4 summit
2 Switzerland

1 tall
1 Terrace
5 top
2 tree
17 trees

1 up

2 vale
90 valley
5 valleys
1 Vermont
2 view
2 volcano

1 Washington
5 White
1 wood
3 woods

10. HOUSE

15 abode
1 alley
3 apartment

1 background
74 barn
1 Bay Ridge
2 beautiful
1 Belknap
4 big
1 blinds
3 boards
2 boat
1 box
23 brick
5 bricks
2 brown
2 build
78 building
2 bungalow

8 cabin
1 camp
1 carpenter
1 carpet
4 castle
1 cattle
1 cellar
2 chair
1 chamber
1 chicken
5 chimney
1 church
2 city
2 clean
1 closed
1 college
9 comfort
1 comforts
3 comfortable
1 contractor
1 corridor
42 cottage
3 cover
1 covering

1 dark
1 den
2 dog
1 domestic
1 domicile
16 door
1 doors
3 dwell
68 dwelling

1 enclosure
1 erection

4 family
1 fancy
2 farm
1 farmer
1 fence
1 field
1 fire
1 floor
1 form
1 foundation
5 frame
1 friends
1 furnace
1 furnishing
11 furniture

10 garden
1 grandmother
1 great
2 green
3 ground
1 grounds

1 habitable
5 habitation
1 happiness
2 height
3 high
3 hill
103 home
1 homeless
4 hospital
1 hot
5 hotel
1 hovel
2 hut

1 inhabitant
1 inhabited
1 inmates
1 into

1 joy

10 land
1 lake
24 large
3 lawn
1 lemon
1 Leonia
2 life
33 live
19 living
18 lot
1 lots
3 lumber

2 man
14 mansion
1 material
1 mine
1 mortgage
1 Mountain House
2 mouse

1 new

1 object
1 old
1 ours

1 palace
1 painting
1 Pasadena
11 people
2 piazza
1 picture
6 place
1 pleasant
3 pretty
1 property
3 protection

4 red
1 refuge
19 residence
2 resident
1 restful
1 road
12 roof
9 room
8 rooms

1 Sage
2 school
1 sea
1 shanty
5 shed
22 shelter
2 sky
2 small
1 spacious
4 square
3 stable
1 star
1 steps
7 stone
1 stoop
2 store
7 street
8 structure

1 tabernacle
1 table
1 tall
1 telescope
1 tenant
2 tenement
3 tent
1 timber
5 top
1 town
2 tree
1 trees
1 tumbler

2 villa
1 village

1 walls
8 warm
1 wealth
1 well
9 white
1 Whittier
1 wide
1 willow
9 window
5 windows
31 wood
1 wooden
1 workman
1 worship

10 yard

11. BLACK

1 agreeable

8 blue
3 board
2 book
2 bright
1 buggy

8 cat
1 chair
1 charcoal
17 cloth
4 clothes
1 cloud
1 clouds
2 cloudy
3 coal
3 coat
129 color
1 colored
3 colorless
1 coon
2 crepe
1 curtain

172 dark
36 darkness
4 death
1 dense
1 desolate
2 dirty
1 disagreeable
1 dislike
4 dog
1 domino
29 dress
2 dye

1 earth
1 ebony

1 face
2 fear
1 figure
1 flecked
1 floor
1 funeral

2 gloomy
1 gown
2 gray
7 green

2 hair
3 hat
1 heavy
1 hog
1 horror
5 horse

1 impenetrable
14 ink

1 lack
12 light

1 mammy
2 man
1 Mrs. B.
2 mournful
17 mourning
1 mud

7 negro
1 negroes
6 nigger
51 night
1 nothing

1 obscure
1 orange

4 paint
1 paper
1 pen
2 pink
1 pipe
1 pit

1 radiator
4 red
1 ribbon
1 robe

1 sad
2 sadness
1 sack
1 shady
2 sheep
4 shoe
1 shoes
1 sign
2 skirt
1 sky
2 somber
1 soot
4 sorrow
1 space
1 spectrum
1 stocking
1 stockings
1 suit

1 table
1 tar
1 terror
1 tie

1 umbrella

1 velvet

2 wall
1 water
339 white
1 wonder
1 wood

2 yellow

12. MUTTON

9 animal
1 animals
1 appetite
1 Australia

1 baa
97 beef
1 bony
1 breakfast
15 broth
1 brown
2 butcher

2 calf
1 cattle
3 cheap
34 chop
83 chops
2 cow
1 delicious
6 dinner
2 disagreeable
1 dish
2 dislike
1 disliked

14 eat
7 eatable
10 eating

7 fat
2 field
10 flesh
1 flock
30 food
1 fork
1 fowl

1 goat
9 good
1 grass
2 grease
1 greasy

2 ham
1 hate
2 head
1 horrid

1 indigestion

1 knife

121 lamb
2 lambs
5 leg

1 Mary
257 meat
1 mouse
1 muttonhead

2 nice

1 old

1 pastures
1 peas
2 pig
3 pork

1 rare
4 roast

1 sauce
204 sheep
1 smell
1 soft
2 soup
1 stale
3 steak
2 stew
2 strong

4 table
6 tallow
3 tender
1 thinking
6 tough

1 uncle

30 veal
1 vegetables
1 vegetarian

4 wool

13. COMFORT

1 agony
1 annoyance

1 bad
42 bed
4 blanket
1 book
1 books

1 canoe
4 care
81 chair
1 cheer
1 children
1 cloth
4 comfortable
1 comforter
2 consolation
1 console
1 consoling
2 content
4 contentment
2 convenience
1 cozy
9 couch
1 cover
1 covering
4 cushion
1 cushions

1 davenport
1 death
1 delightful
2 desirable
24 discomfort
1 disease
1 displeasure
4 distress

1 driving

165 ease
11 easiness
61 easy
1 eating
1 enjoying
6 enjoyment

1 feather
1 feeling
2 fireplace
2 fireside
1 friends

1 God
5 good
1 goodness
1 great
1 grief

7 hammock
50 happiness
17 happy
2 hard
7 hardship
1 healing
15 health
3 help
63 home
4 house
1 household

1 I
1 idleness
1 ill

9 joy

1 justice

1 kindness

1 lamp
2 laziness
1 lazy
6 leisure
1 less
1 life
1 like
2 living
1 loneliness
6 lounge
1 luxurious
23 luxury

1 man
1 mansion
1 miserable
9 misery
9 money
3 mother

1 neatness
4 nice
1 none
2 nurse

4 pain
2 palace
1 patient
12 peace
1 people
2 pillow
1 pipe
1 playing
9 pleasant

1 please
77 pleasure
1 plentiness
1 plenty
1 Polly
1 post

6 quiet
1 quietness
7 quilt

1 rain
1 relief
53 rest
1 restful
1 restfulness
5 resting
1 rich
3 rocker

1 safety
1 salary
4 satisfaction
3 satisfied
1 security
1 settled
1 sick
3 sickness
1 sit
4 sitting
10 sleep
1 slippers
1 slumber
1 smoke
1 smoking
5 sofa
2 soft
1 solace

11 solid
3 solitude
2 soothing
5 sorrow
1 speak
1 spirit
1 spread
1 suffering
1 sweet
1 swing

2 table
1 taken
1 tea
1 thankfulness
1 tired
1 trials
1 trouble

1 uncomfort
10 uncomfortable
3 uneasiness
3 uneasy
1 unrest
1 unwell

6 warm
4 warmth
6 wealth
8 well
1 well-being
1 wine
1 wish
1 woman
1 wool
1 work

1 ye

14. HAND

2 anatomy
63 arm
2 arms

1 ball
3 beautiful
3 black
1 bleeding
48 body
1 bone
1 bones
1 busy

2 cards
1 clean
1 clock
1 convenience
1 cradle
1 cunning

1 dexterity
1 diligence
1 dissecting
1 do
2 doing
1 dog

1 ear
1 elbow
6 extremity

7 face
1 fat

11 feel
5 feeling
35 feet
2 fellowship
39 finger
83 fingers
1 fist
19 flesh
204 foot
1 form
1 formation
1 friend
1 friendship
1 fruit

1 give
20 glove
5 gloves
1 good
8 grasp
1 greeting
8 grip

1 handle
3 handy
1 hard
1 head
2 heart
6 help
2 helper
1 helping
3 hold
1 holding
2 human

2 instrument

1 jewel

1 kindness
1 knife
1 knitting

1 labor
1 large
4 leg
1 legs
1 lemon
2 life
43 limb
1 limbs
1 long
1 love

2 machine
1 maid
3 man
1 manipulation
14 member
1 mind
1 mine
4 mouth
1 move
4 muscle

2 nail
1 nails
1 name

1 narrow
2 necessity
1 nice
1 nimble
1 nose

1 object
4 organ

5 palm
1 part
2 paw
1 pencil
1 perfect
10 person
1 piano
1 pen
3 power
3 pretty
1 purity

1 reach
1 rest
11 right
23 ring
2 rings

1 satisfaction
1 servant
2 sew
2 sewing
9 shake
1 shape

1 shapely
1 shop
1 shoulder
4 skin
1 slim
8 small
1 soap
8 soft
1 something
1 sore
6 strength
8 strong
1 support
1 system

1 table
1 thread
9 touch
2 two

12 use
24 useful
4 usefulness

1 watch
1 woman
49 work
15 white
4 wrist
8 write
11 writing

1 you

15. SHORT

2 abbreviated
1 age
2 arm

1 baby
1 beach
1 beam
1 board
8 boy
1 brevity
1 brick
7 brief
1 broad
1 build

1 C.
1 cake
1 chair
1 change
4 child
1 children
1 clock
1 cloth
1 comfort
1 compact
1 cut
1 cylinder

1 dainty
4 day
2 deficient
1 dimension
1 diminiature
2 diminutive
1 disagreeable
10 distance
1 dot
1 down
1 drawn
8 dress
2 dumpy
11 dwarf
1 dwarfs

2 easy
1 elongated
1 extension

4 fat
1 finger
1 flowerpot
2 foot
2 friend

11 girl
1 good
1 grandmother
5 grass

2 hair
1 happiness
13 height
4 high
1 hour
3 hours

5 inch

2 journey

1 Karl

1 lacking
4 lady
1 lake
2 large
2 leg
18 length
1 lesson
1 lessons
5 life
15 little
1 line
1 lived
279 long
11 low
1 lowly

20 man
8 measure
1 measurements
2 medium
1 midget
1 millimeter
1 minus
1 Miss K.
1 money
1 mother
6 myself

1 name
1 narrow
1 near
1 needle
1 not

1 out

6 pencil
8 people
15 person
1 petticoat
1 pin
1 pity
1 plant
1 plants
1 pony
2 post
2 pygmy

8 quick
1 quickly

1 road
1 round

1 session
1 shallow
1 sister
5 size
1 skirt
1 sleek
1 slight
1 slightly
136 small
1 space
2 speech
1 square
1 staccato
2 stature
2 stem
8 stick
2 stop
1 story
24 stout
1 strawberries
2 street
1 string
1 strong
1 stubborn
9 stubby
4 stumpy
1 stunned
1 stunted
1 sufficient
1 sum
1 sweet

168 tall
6 thick
1 thin
8 time
1 tiny
1 Tom Thumb
1 tree

1 unpleasant
1 useless

1 vacation

1 waisted
8 walk
1 want
2 wanting
1 water
1 well
1 wide
6 woman
1 wood
1 worm

1 you

16. FRUIT

2 acid
2 appetite
157 apple
102 apples
1 article

1 bake
11 banana
8 bananas
7 berries
1 berry
1 blackberries
2 bread

2 cake
1 can
1 candies
8 candy
2 cherries
2 cherry
1 country
1 currants

1 dainty
2 delicacy
9 delicious
1 desire
1 digest
1 digestion

1 easy
62 eat
83 eatable
15 eatables
35 eating
1 edible
1 eggs
2 enjoyment

1 figs
1 fish
1 flesh
3 flower
8 flowers
1 fond
22 food
1 fresh

2 garden
24 good
2 grain
4 grape
14 grapes
1 grapefruit
1 green
1 groves
1 grow
1 grows
2 growth

8 health
8 healthy
1 home

1 Italians
1 invigorating
1 jam
6 juice
5 juicy

1 knife

2 lemon
1 liked
1 love
3 luscious
2 luxury

4 meat
1 medicine
1 melon
1 milk

1 nourishing
2 nourishment
5 nice
2 nutritious
2 nuts

25 orange
20 oranges
6 orchard
1 outcome

2 palatable
17 peach
82 peaches
24 pear
11 pears
1 picking
1 pie
2 pineapple
1 plant
1 plants
2 pleasant
1 pleasure
2 plenty
2 plum
2 produce
1 prune

1 raspberries
1 raspberry
1 red
1 result
9 ripe
1 ripeness

1 salad
5 seed
1 sickness
4 sour
1 south
1 spring
1 stalk
1 stand
1 stems
1 store
2 strawberries
1 strawberry
2 summer
1 swallow
24 sweet
1 sweets

3 table
5 taste
35 tree
27 trees

75 vegetable
28 vegetables

1 watermelon
1 wine

17. BUTTERFLY

- 1 air
- 1 airiness
- 2 airy
- 24 animal
- 2 animals
- 2 ant

- 1 beast
- 24 beautiful
- 20 beauty
- 31 bee
- 4 bees
- 5 beetle
- 64 bird
- 10 birds
- 2 black
- 1 blossom
- 1 blue
- 2 bread
- 1 bright
- 2 brilliant
- 1 brown
- 1 bush
- 3 butter
- 6 buttercup
- 11 bug
- 1 bugs
- 1 bumblebee

- 1 cabbage
- 87 caterpillar
- 1 caterpillars
- 1 chase
- 3 chrysalis
- 6 cocoon
- 1 cocoons
- 4 collection
- 12 color
- 8 colors
- 3 colored
- 2 country
- 1 cricket

- 1 daisy
- 1 dish
- 1 dove
- 1 dress
- 1 dust

- 1 eagle
- 1 ease
- 1 ephemeral

- 1 fairy
- 2 field
- 1 fields
- 1 firefly
- 6 flies
- 2 flight
- 1 flippant
- 1 flittering
- 1 flitting
- 1 flits
- 13 flower
- 12 flowers
- 2 flutter
- 1 fluttering
- 44 fly
- 20 flying

- 1 gaudy
- 1 gauze
- 2 gay
- 2 girl
- 2 gnat
- 3 golden
- 1 good
- 2 grace
- 1 graceful
- 1 grass
- 5 grasshopper
- 2 grasshoppers
- 5 grub

- 1 handsome
- 1 happy
- 1 high
- 1 horse
- 1 human

- 1 idler
- 261 insect
- 2 insects

- 1 Japanese

- 1 kite

- 1 lady
- 8 lepidoptera
- 5 light
- 2 lightness
- 1 lilies
- 1 little

- 1 meadows
- 1 metamorphosis
- 4 miller
- 1 monarch
- 3 mosquito
- 1 motion
- 30 moth
- 1 moths
- 1 mountains
- 1 mourning cloak

- 2 nature
- 6 net
- 1 nets
- 2 nice

- 1 orange
- 1 outdoors

- 1 pancake
- 1 pig
- 2 pigeon
- 1 plumage
- 1 powder
- 39 pretty

- 1 red

- 2 small
- 1 snakes
- 1 snare
- 1 soul
- 1 sparrow
- 1 speckled
- 9 spider
- 2 spotted
- 5 spring
- 17 summer
- 1 sun
- 5 sunshine
- 1 swallow
- 1 sweet
- 1 swift

- 1 temporary
- 1 tree
- 1 two

- 1 useless

- 2 vanity
- 1 variegated

- 11 wasp
- 2 white
- 1 wind
- 11 wing
- 31 wings
- 1 word
- 12 worm
- 2 worms

- 87 yellow

18. SMOOTH

- 2 apple

- 1 ball
- 1 basin
- 2 bed
- 9 board
- 1 butter

- 4 calm
- 1 carpet
- 1 character
- 1 cheek
- 1 chip
- 1 circus
- 2 clean
- 3 clear
- 3 cloth
- 1 clothes
- 2 coarse
- 1 coat
- 1 country
- 1 course
- 2 cream
- 1 cube

- 1 deceitful
- 1 deep
- 1 desk
- 1 done
- 1 dry

- 2 ease
- 12 easy
- 80 even
- 1 evenness
- 3 face
- 1 fair
- 1 feeling
- 8 fine
- 2 finished
- 14 flat
- 2 flexible
- 15 floor
- 1 folded
- 2 fur

- 56 glass
- 4 glassy
- 1 glazed
- 3 glide
- 1 gliding
- 11 glossy
- 2 good
- 1 goods
- 1 grand
- 3 grass
- 1 grease
- 4 ground

- 3 hair
- 2 hand
- 41 hard
- 1 harmonious
- 4 harsh

- 14 ice
- 13 iron
- 1 ironing
- 1 ivory
- 1 kind

- 1 lake
- 2 lawn
- 1 lens
- 52 level
- 1 lightly
- 1 lovely

- 1 machinery
- 1 mahogany
- 10 marble
- 1 mercury
- 1 mild
- 1 mirror
- 1 molasses

- 1 narrow
- 4 nice
- 1 nicely

- 1 oyster

- 1 paint
- 9 paper
- 2 paste
- 1 pat
- 1 path
- 1 pebble
- 1 person
- 1 piano
- 1 placid
- 17 plain
- 23 plane
- 1 planed
- 5 pleasant
- 1 pleasing
- 1 plum
- 5 polished
- 1 pressed

- 1 quality
- 1 queer

- 1 razor
- 2 river
- 4 road
- 1 roads
- 2 roof
- 277 rough
- 2 round
- 1 rubber
- 1 rugged
- 1 rule
- 1 running

- 1 sailing
- 1 sandpaper
- 2 satin
- 1 sea
- 1 shape
- 1 sharp
- 1 shave
- 4 shiny
- 4 silk
- 1 silken
- 5 skin
- 2 sleek
- 3 slick
- 4 slippery
- 2 small
- 1 snake
- 79 soft
- 1 softness
- 1 sphere
- 1 stone
- 2 straight
- 1 street
- 1 stroke
- 25 surface

- 29 table
- 1 thin
- 1 thought
- 1 tidy
- 1 tomato
- 1 tongue
- 4 touch
- 1 tranquil

- 2 uneven

- 29 velvet
- 1 velvety
- 1 very

- 5 wall
- 1 walls
- 10 water
- 1 wave
- 1 window
- 8 wood
- 1 work
- 1 worm
- 1 wrinkled
- 1 wrinkles

19. COMMAND

1 ability
1 act
1 acting
1 anger
1 answer
1 anything
1 appeal
1 appearance
16 army
1 arrogance
2 ask
2 asking
1 athletics
3 attention
14 autbority

1 baseball
1 Bible
1 bid
6 boss
1 boy

7 captain
2 charge
2 chief
1 church
1 combine
1 combined
5 come
5 commander
2 commandment
2 company
1 compel
8 control
1 cross

1 dare
18 demand
1 demanding
2 desire
2 determined
3 dictate
1 dictatorial
2 dignity
2 direct
1 disability
2 discipline
1 dislike
27 do
3 doing
2 domineer
2 domineering
2 done
2 don't
1 door
2 drill
1 driver
5 duty

1 earnestness
1 easy
1 eat
1 effort
1 employ
1 employees
1 enforce
1 entreat
7 entreaty
1 exclamation
1 exertion
1 experience

1 father
1 firm
1 forbid
7 force
1 forced
1 foreman

1 gain
43 general
1 gentleness
1 gently
1 Germany
1 give
25 go
1 God
1 God's
2 good
1 govern
1 grand

4 halt
4 harsh
1 harshly
1 haughty
1 head
1 him
1 holy
1 honorable
1 horse

1 I
1 immediately
3 imperative
4 imperious
1 independent
1 insist
1 instant
1 institution
2 instruct
1 instruction
1 intelligence

1 judge

1 knowing

1 labor
1 language
2 law
1 laziness
2 lead
1 leader
1 lieutenant
2 listen
2 loud
1 love

1 madam
9 man
2 master
1 masterful
3 military
2 mind
1 mother
1 move
1 must

1 noble
1 nuisance
12 obedience
2 obedient
230 obey
1 obeyed
30 officer
1 only
171 order
2 ordering
9 orders

1 parents
1 peace
2 people
2 peremptory
1 perfect
1 person
1 plead
1 policeman
10 power
2 powerful
1 praise
1 proper

1 question
1 quick

2 refuse
1 regiment
1 reply
2 reprimand
11 request
5 respect
1 respond
1 retreat
3 right
2 rule
1 ruling
1 running

1 say
1 saying
2 school
1 severe
1 shalt
1 ship
16 soldier
6 soldiers
1 something
3 speak
1 spoken
1 stamina
1 statement
7 stern
3 strength
1 strict
3 strong
1 stubborn
1 superintend
1 superior
1 supervisor
1 surly
1 surrender

2 talk
1 teach
14 teacher
1 teachers
1 teaching
15 tell
1 telling
3 temper
1 temperament
1 thee
1 them
2 think
1 thinking
1 thoughtfulness
1 threat
2 told

1 uncomfortable
1 upright

6 voice
1 vow

1 wagon
1 wife
3 will
1 willing
2 words
2 work
1 wrong

3 you

20. CHAIR

4 arm
4 article

1 back
1 beauty
1 bed
13 bench
1 book
1 boy
2 broken
4 brown
1 bureau

3 cane
1 caning
1 careful
1 carpet
1 cart
1 color
21 comfort
3 comfortable
3 convenience
5 couch
1 crooked
12 cushion
1 cushions

9 desk

7 ease
6 easy

1 fatigue
10 floor
1 feet
1 foot
1 footstool
1 form
33 furniture

1 Governor Winthrop

1 hair
5 hard
2 hickory
4 high
2 home
3 house
1 idleness
1 implement

1 joiner

3 large
7 leg
11 legs
3 lounge
3 low
1 lunch

3 mahogany
1 massive
1 mission
5 Morris
1 myself

2 necessity

2 oak
1 object
1 occupy
1 office
1 people
3 person
1 place
1 placed
1 plant
1 platform
1 pleasant
1 pleasure
1 posture

1 reading
45 rest
3 resting
17 rocker
15 rocking
9 room
2 rounds
1 rubber
3 rung

127 seat
5 seated
2 seating
3 settee
107 sit
56 sitting
1 size
6 sofa
5 soft
1 spooning
1 stand
38 stool
1 stoop
1 study
1 support

191 table
1 tables
1 talk
1 teacher
1 timber
1 tool

1 upholstered
1 upholstery
2 use
3 useful

1 white
49 wood
6 wooden

21. SWEET

5 agreeable
1 appetizing
11 apple
3 apples

3 beautiful
50 bitter
1 black
1 breath

1 candies
82 candy
1 cherries
1 child
3 chocolate
1 chocolates
2 clean
1 confectionery
1 cream
1 cunning

7 delicious
1 dessert

1 dinner
1 dog
1 dreams

1 E.
2 eat
1 elegant
1 eyes

1 face
2 flavor
2 flower
3 flowers
1 food
1 fresh
9 fruit

1 gentle
6 girl
26 good

2 harsh
12 honey

1 hunger
1 Huyler's

1 insipidity

2 kiss

1 limited
1 lovely
1 loving
2 low

1 Mary
1 mellow
1 melody
2 milk
1 molasses
1 mouth
8 music
1 musty

1 name
1 nausea

33 nice

1 orange
2 oranges

9 palatable
3 peach
1 peaches
3 perfume
2 pie
1 plausible
31 pleasant
4 pleasing
1 pleasurable
1 pleasure
1 plum
1 preserves

1 quality

1 saccharine
3 salt
1 salty

1 sharp
1 sickish
2 sixteen
6 soft
1 soothing
301 sour
1 stuff
224 sugar
2 syrup

57 taste
4 tasteful
2 tasting
11 tasty
1 tea
2 toothsome

1 ugly
1 unpleasant

1 very
1 voice

1 wholesome

22. WHISTLE

1 act
1 action
7 air
3 alarm
1 annoyance
2 attention
1 automobile

1 bad
2 bell
15 bird
3 birds
1 blast
5 blew
95 blow
6 blowing
2 blows
2 boat
66 boy
5 boys
1 breath
1 bright
1 brother
1 buzzing

26 call
2 calling
2 cars
1 cent
3 chain
1 children
1 clean
1 clear
1 come
1 conductor

1 crow
2 cry
1 cuckoo

3 dance
1 dear
1 disagreeable
1 distant
7 dog
1 drink
1 dumb

1 ear
3 echo
1 effort
15 engine

2 factory
3 fife
1 fingers
3 fire
5 flute
1 fly
2 Franklin
2 fun
1 funny

1 Galton
1 girl

1 habit
3 happiness
1 harmony
1 harsh

5 holler
1 hollow
4 horn
1 humming

6 instrument

2 joy

1 lad
3 laugh
1 letter-carrier
5 lips
5 locomotive
3 long
27 loud
1 low

1 man
1 mash
1 melodious
1 metal
2 mill
1 mine
1 mocking
27 mouth
44 music

3 nice
1 nightingale
173 noise
3 noisy
1 note
1 notes

1 person
1 piercing
7 pipe
2 pleasure
1 police
6 policeman
1 postman
1 postman's
1 pretty
4 pucker

1 quiet

2 racket
1 report
1 running

1 scream
1 screech
5 sharp
4 shout
1 shrieking
26 shrill
1 shrillness
3 signal
1 sang
75 sing
4 singing
1 soft
1 softly
12 song
1 songs
1 sorority
103 sound

1 sounds
3 steam
1 steamboat
1 stick

4 talk
1 telephone
1 throat
7 tin
1 tool
1 top
4 toy
6 train
1 tree
2 trumpet
18 tune

1 umpire
1 unpleasant

1 vibration
3 voice

1 warble
1 warning
1 whisper
1 whispering
8 willow
10 wind
1 wood
1 wooden
1 work

1 yell

23. WOMAN

- 2 adult
- 1 affinity
- 1 aged
- 2 angel
- 1 appearance
- 1 appreciating
- 1 artificial

- 1 baby
- 1 Barnard
- 17 beautiful
- 7 beauty
- 9 being
- 1 Bible
- 1 biped
- 8 body
- 1 bonnet
- 3 boy
- 1 bright

- 1 capability
- 1 cat
- 1 character
- 45 child
- 2 children
- 2 clean
- 1 clever
- 6 clothes
- 1 clothing
- 2 comfort
- 1 companion
- 4 creature
- 1 cross

- 1 dear
- 1 deceit
- 1 delicate
- 1 delightful
- 1 develop
- 1 dignity
- 1 dinner
- 1 domestic
- 28 dress
- 4 dresses
- 1 dressmaker
- 1 dust

- 1 Edna
- 1 endurance
- 2 Eve
- 1 eyes

- 9 fair
- 3 fashion
- 134 female
- 10 feminine
- 2 flesh
- 1 figure
- 2 fine
- 1 freedom
- 3 friend

- 1 genteel
- 5 gentle
- 1 gentleness
- 59 girl
- 3 girls
- 1 goddess
- 4 good
- 1 goodness
- 1 gown
- 3 grace
- 2 graceful
- 2 grand
- 1 grandmother
- 2 great

- 9 hair
- 4 handsome
- 5 hat
- 1 hats
- 1 helper
- 3 helpmate
- 1 her
- 3 home
- 1 honor
- 2 house
- 1 housekeeper
- 1 housewife
- 11 human
- 2 humanity

- 1 inexplicable
- 1 individual
- 1 intellect
- 1 interesting

- 5 kind
- 1 kindness

- 2 labor
- 41 lady
- 4 large
- 1 leader
- 1 liar
- 1 living
- 1 lovable
- 5 love
- 1 loveliness
- 3 lovely
- 1 loving

- 1 Mabel
- 1 maid
- 1 majesty
- 292 man
- 2 mankind
- 2 marriage
- 2 married
- 2 mate
- 1 modesty
- 30 mother
- 1 Mrs. S.
- 1 myself

- 1 nature
- 1 necessity
- 3 nice
- 1 noble
- 1 nurse

- 1 old

- 1 palmist
- 1 parasol
- 1 people
- 1 perfection
- 17 person
- 1 petticoats
- 3 pleasure
- 10 pretty
- 1 purity

- 1 rib

- 5 sex
- 5 short
- 4 sister
- 3 skirt
- 3 skirts
- 2 slender
- 1 small
- 1 softness
- 1 spiritual
- 2 stout
- 2 style
- 1 suffrage
- 2 sweet
- 2 sweetness
- 1 sweetheart

- 1 talk
- 7 tall
- 1 teacher
- 1 temporary
- 1 truth

- 1 uneasy
- 1 use

- 2 virtue

- 1 waist
- 1 walks
- 1 weak
- 2 weakness
- 15 wife
- 1 will
- 1 womanhood
- 2 work

- 5 you
- 4 young

24. COLD

- 1 activity
- 2 agreeable
- 4 air
- 1 arctic
- 4 atmosphere
- 1 autumn

- 2 bad
- 4 bitter
- 1 bracing
- 1 breezy
- 1 brisk
- 1 bum

- 9 chill
- 80 chilly
- 2 clothes
- 1 clothing
- 1 coal
- 5 coat
- 2 comfort
- 1 comfortable
- 1 comfortless
- 5 cool
- 5 cough
- 2 cure

- 2 damp
- 4 dark
- 1 darkness
- 5 day
- 1 death
- 1 degree
- 6 disagreeable
- 8 discomfort
- 3 dreary

- 1 feel
- 10 feeling
- 1 feet
- 1 Finland
- 6 fire
- 1 fold
- 7 freeze
- 23 freezing
- 2 frigid
- 9 frost
- 4 frozen
- 1 fuel
- 2 furs

- 1 grippe
- 1 gloomy

- 1 ham
- 1 hands
- 2 hard
- 2 head
- 1 hearted
- 37 heat
- 151 hot

- 114 ice
- 1 ice-cream
- 1 irritating

- 1 January

- 1 latitude
- 1 lemonade
- 2 light

- 2 man
- 1 medicine
- 1 misery
- 1 mushroom

- 1 nature
- 1 naughty
- 1 near
- 1 never
- 1 night
- 1 numb
- 1 numbness

- 1 overcoat

- 1 pain
- 1 Peary
- 2 penetrating
- 1 pleasant
- 1 pressure

- 1 quiet

- 1 raw
- 1 refrigerator
- 1 rhinitis
- 1 room
- 1 running
- 1 rough

- 1 sensation
- 5 severe
- 3 sharp
- 6 shiver
- 2 shivering
- 1 shivers
- 1 shivery
- 1 shrivel
- 1 shudder
- 4 sick
- 6 sickness
- 1 skating
- 1 sleighing
- 1 slow
- 1 sneezing
- 45 snow
- 1 snuffles
- 1 stone
- 1 storm
- 3 stove

- 1 temperate
- 8 temperature
- 1 thermometer
- 1 touch

- 10 uncomfortable
- 4 unpleasant

- 168 warm
- 6 warmth
- 7 water
- 49 weather
- 1 well
- 1 white
- 5 wind
- 1 windy
- 120 winter
- 1 wraps

- 2 zero

25. SLOW

1 action
1 age
1 anger
2 animal
1 ant
1 anxiety
1 association
1 automobile
1 awful

2 baby
3 backward
1 backwards
1 bad
1 bear
1 beggar
1 behind
1 better
1 Bill
3 boat
1 boring
2 boy
1 breakdown

1 camel
1 canal boat
6 car
2 cars
1 careful
1 carpenter
1 cart
1 catch
2 caterpillar
1 caution
1 child
1 climb
5 clock
3 coach
1 conversation
1 cow
1 crawl
1 creep
2 creeping

1 dead
1 decrease
2 delay
1 deliberate
2 dilatory
1 distance
1 dizzy
1 donkey
1 drag
1 dragging
2 dreary
1 dressing
1 drive
1 driver
1 drone
1 Dr. R.
7 dull

2 ease
63 easy
1 Erie

316 fast
1 feeble
1 fine
1 fire
1 fly
1 foot
1 funeral

3 gait
1 gin
1 going

2 hard
3 haste
2 hasty
1 heavy
14 horse
1 hot
3 hurry

1 impatience
1 inactive
1 inanition
1 incessant
1 indecision
1 insect
2 invalid
1 irritating

1 laggard
1 lagging
1 lassitude
2 late
2 laziness
23 lazy
1 lecture
1 leisure
1 lingering
6 long

3 man
1 march
1 market
3 me
1 medium
1 mice
1 mind
1 mode
1 moderate
20 molasses
1 monotonous
1 moon
7 motion
1 motionless
1 move
8 movement
5 moving
1 Mr. T.
3 mule
3 music
3 myself

1 nasty
1 nature

1 obstacle
2 old
2 ox
1 oxen

1 pace
1 papa
8 person
2 Philadelphia
1 poke
2 poky
1 Poughkeepsie
1 pupil

1 quality
56 quick
2 quickly
1 quickness
12 quiet

1 rain
9 rapid
1 rhythmic
1 river
1 Rose
2 run

1 sharp
1 short
1 sick
1 sickness
1 slack
2 sloth
1 slowly
7 sluggish
10 smart
1 smooth
62 snail
1 snails
1 snake
1 softly
2 speech
7 speed
1 speedless
1 starting
2 step
3 still
3 stop
1 stubborn
7 stupid
1 subway
27 sure
8 swift
1 swing

1 talk
8 tardy
1 team
1 tedious
1 terrapin
1 thought
1 thoughtful
1 tide
14 time
5 tired
2 tiresome
4 tortoise
18 train
1 trains
1 trolley
9 turtle

2 unpleasant
1 unsatisfactory

1 vehicle

7 wagon
8 walk
7 walking
1 walks
1 water
1 waves
2 weak
1 weather
1 wheel
1 white
1 work
1 working
1 world
8 worm
1 writing

1 you

26. WISH

1 accomplish
1 accomplishment
1 achieve
1 Aladdin
2 ambition
1 angel
1 answer
1 anxiety
1 anxious
1 any
7 anything
1 apology
1 ardent
8 ask
1 asking
1 attain

1 baby
2 beg
1 benefit
1 best
1 better
19 bone
1 books
1 boy
1 boys
1 breakfast
1 brightness

1 candy
1 cannot
1 check
2 chicken
2 child
3 Christmas
1 clover
1 clovers
1 cold
2 come
4 comfort
9 command
1 conditions
2 cool
1 craving

2 demand
1 desirable
197 desire
1 desires
1 diamond
1 disappoint
1 disappointed
3 disappointment
1 dish
1 dislike
1 did
5 do
1 dog
1 doll
1 dollars
2 dream
1 dress
1 driving

1 eat
1 entreaty
1 enjoyment
1 examination
1 expectation
5 express
1 expression

11 fairy
2 fancy
1 farm
5 favor
1 feeling
1 finish
1 fish
1 fond
1 foolishness
5 for
2 fortune
1 fulfil
2 fulfilled
6 fulfilment
1 fun

2 gain
14 get
4 gift
1 girl
3 give
1 glad
4 go
1 gold
19 good
7 grant
15 granted
4 gratification
6 gratified
11 gratify
1 greetings
2 guess

18 happiness
8 happy
1 hard
2 hat
1 hate
18 have
6 health
1 hearty
3 heaven
1 heavens
1 help
12 home
51 hope
1 hoping
2 hopeful
1 house

2 idea
1 imagination
1 impossible
1 inclination

2 journey
1 joy

1 know

2 letter
8 like
1 liked
1 lonesome
10 long
18 longing
2 love
9 luck

1 make
1 marry
2 million
4 mind
32 money
1 moon
1 morning
1 music
1 myself

1 news
1 nice
1 no

8 obey
1 object
1 obtain
1 offer
1 one
1 opportunity
1 opposition
1 orange
1 order

1 perhaps
1 person
1 pick
1 picture
1 pie
1 plan
1 play
1 pleasant
5 pleasure
2 plenty
3 position
1 possess
1 possession
2 present
2 promise

1 quiet

1 reality
1 receive
1 remembrance
1 renown

1 repeat
8 request
1 rest
1 rich
3 riches
1 ring

1 sail
1 satisfactory
2 satisfied
1 satisfy
1 satisfying
2 say
1 secret
1 sincere
1 sleep
1 some
15 something
1 sorrow
1 sorry
1 speak
1 special

9 star
2 stars
1 strong
4 success
1 suggest
2 summer
1 sweetheart
1 swim

18 think
6 thinking
47 thought
1 toy
1 trip
1 trouble
6 true
1 try

1 unattainable
1 uncertain
1 unfulfilled
1 unlawful

1 unsatisfied

2 vacation

66 want
1 wants
1 wanted
9 wanting
1 waste
1 watch
1 water
2 wealth
6 well
3 will
2 wisdom
1 wise
14 wishbone
2 wonder
2 would
1 wouldn't

1 yes
1 you

27. RIVER

1 Amazon
1 Androscoggin

1 bank
2 banks
1 barrow
8 bathing
1 bay
4 beautiful
1 beauty
1 bend
6 blue
20 boat
8 boats
1 boating
1 body
2 bridge
5 broad
20 brook
1 bubbling

1 Calumet
1 camping
1 canal
8 canoe
1 canoeing
1 Chignagnette
1 cliffs
1 commerce

1 Connecticut
10 creek
8 current

1 dangerous
35 deep
1 Delaware
1 depth
1 drowned

4 East

1 fish
24 flow
5 flows
17 flowing
1 Freiberg
1 front

1 God
1 Grand
1 green

33 Hudson

1 island

1 Jordan

65 lake
1 lakes
5 land
7 large
1 launch
1 length
1 life
1 liquid
8 long

1 meadow
8 Mississippi
1 Missisquoi
1 Missouri
1 Mohawk
1 motion
10 mountain
2 moving

17 ocean
2 Ohio
1 Ottanqueehee
1 Owasco

1 Pacific
2 peace
1 Piscatague
1 plain
1 pleasure

5 pond

1 rain
1 Rappahannock
2 rapid
1 Rhine
1 rill
2 rivulet
1 rivulets
1 row
1 rowing
8 run
8 runs
6 running
1 rushing

1 Saco
4 sailing
1 salt
14 sea
2 shallow
1 Shannon
2 shining
4 ship
1 ships
1 side
1 sky
2 slow
1 small

7 smooth
1 spring
1 St. Lawrence
117 stream
1 streams
1 streamlet
1 strong
1 sunset
2 Susquehanna
8 swift
4 swim
4 swimming

1 Tay
1 tide
1 tree
1 tug
1 turbulence

5 valley

1 Ware
393 water
8 well
2 wet
8 white
5 wide
2 winding
1 winds

28. WHITE

1 almost
2 apron

1 baby
1 beach
1 beautiful
1 beauty
1 bird
308 black
1 bleached
9 blue
1 boat
1 Bob
1 body
1 bride
4 bright
1 brightness
1 Broadway
3 brown

2 cat

1 cerement
1 chair
3 chalk
1 cheerful
1 cherries
10 clean
2 cleanliness
1 cleanness
2 clear
17 cloth
1 clothing
4 cloud
2 clouds
1 coat
170 color
1 colored
11 colorless
3 cotton
1 cream
2 curtain
1 curtains

85 dark
1 darkness
1 day
1 daylight
2 dazzling
1 delicate
2 dove
34 dress
1 dresses

2 easy
1 evening

1 face
2 feathers
2 flag
2 flower

2 garment
1 ghost

1 glare
1 good
2 gray
6 green

1 hall
2 handkerchief
1 hands
1 hard
2 horse
4 house

1 innocence

1 lady
1 lawn
1 lead
1 lemon
1 lie
51 light
8 linen

1 lovely

2 man
1 marble
9 milk
1 Mountain
1 Mountains
8 muslin

1 napkin
1 nearly
2 nice

5 paint
2 pale
17 paper
1 pencil
2 person
1 pigeon
2 pink
1 pleasing

1 powder
1 pretty
20 pure
19 purity

1 race
7 red
1 restful
1 retired
1 ribbon

1 rightness
2 rose

1 sand
1 Sarah
1 shade
6 sheet
1 shoes
1 shroud

1 silvery
1 simple
1 skirt
2 sky
91 snow
1 snowflake
1 snowy
1 soft
1 soul

1 space
1 spread
2 still
1 summer
1 sunlight
1 swan

4 tablecloth
1 tent

1 tile
1 trees
1 trousers

2 waist
6 wall
1 wash
2 wedding

7 yellow

29. BEAUTIFUL

1 admirable
1 admiring
1 aesthetic
1 all
1 ancient
2 appearance
6 art
1 artistic
1 article
1 attractive

1 baby
1 bird
1 birds
1 brilliant
1 building
2 butterfly

1 carpet
1 carving
7 charming
6 child
1 city
1 classic
1 clear
1 clouds
1 color
1 colors
8 comely
1 common
8 complexion
1 conceited
3 country
1 curtain

1 dainty
7 day
1 delicious
5 delightful
1 description
1 desire

1 divine
2 dress

1 earth
5 elegant
1 enjoyed
1 ethereal
2 Eunice
1 Evelyn
1 everything
4 exquisite
1 eye
2 eyes

3 face
5 fair
1 falls
2 fancy
1 fascinating
8 fine
13 flower
42 flowers
1 foliage
1 forest
1 Formosa
1 fragrant
2 friend

1 gift
24 girl
2 glorious
2 God
4 good
2 gorgeous
1 graceful
40 grand
2 grandeur
1 grass
1 grounds

1 hand

86 handsome
1 happy
1 hard
1 hateful
2 heaven
1 heavens
1 hideous
2 hills
27 homely
1 horrible

1 joy

1 kind

5 lady
1 lake
7 landscape
1 lightness
1 long
1 look
1 looks
1 looking
2 lovable
64 lovely
1 luxurious

10 magnificent
2 maiden
2 man
1 mansion
1 money
1 morning
2 mountain
6 mountains
4 music
1 myself

16 nature
1 Niagara Falls
73 nice

1 nicely
1 night
1 noble

1 object
3 ocean

2 Palisades
1 pansies
1 park
3 peacock
1 perception
3 perfect
1 perfection
2 person
10 picture
4 pictures
1 place
2 plain
14 pleasant
16 pleasing
2 pleasure
113 pretty

1 queen

1 rainbow
1 religion
1 resplendent
1 ribbon
1 rich
1 robin
6 rose
2 roses

1 sad
1 satisfaction
1 scarce
1 scene
23 scenery
1 school

1 sculpture
1 sensitive
1 shapely
1 sight
16 sky
1 soft
1 sometimes
1 soothing
1 sorrowful
8 splendid
1 statue
1 straw
2 summer
1 sun
8 sunset
1 sunshine
1 superb
1 supreme
4 sweet
1 symphony

2 things
4 tree
10 trees

2 ugliness
66 ugly

1 vanity
1 verdure
1 violets

4 weather
1 wife
29 woman
1 women
1 wonderful
2 world

1 you

30. WINDOW

12 air
1 airing
1 airy
2 aperture
1 awning

1 bars
4 blind
1 breeze
3 bright
2 broken

1 cage
3 casing
1 children
1 church
6 clean
1 cleaner
7 clear
1 colored
1 cool
18 curtain
4 curtains

1 danger
2 dirty
57 door
1 doors
1 doorway
1 draught

1 eyes

1 few
5 frame

1 garden
316 glass
1 glasses

4 hole
1 home
22 house

1 joyful

2 landscape
11 large

2 lattice
1 ledge
186 light
15 look
5 looking
1 low

1 Newcastle

1 object
19 open
1 opened
16 opening
1 outdoors
5 outlook

82 pane
6 panes
1 picture
1 porch

1 rain
1 rock
3 room

20 sash
2 scene
3 scenery
2 school
1 screen
1 screens
1 seat
9 see
8 shade
2 shades
1 shed
1 shining
7 sight
1 sightly
13 sill
1 sky
3 skylight
1 small
1 square
2 stained
1 stop
1 street
1 structure
8 sun

2 sunshine

1 thing
1 translucent
1 transom
24 transparent
2 trees

2 useful

1 vast
5 ventilation
2 ventilator
15 view
1 viewing
1 visible
1 vision

4 wall
1 wash
2 wide
2 winter
1 wood

31. ROUGH

4 bad
1 bag
1 ball
1 basket
1 bear
1 blisters
1 blow
10 board
1 boards
4 boisterous
2 bold
4 boy
4 boys
1 bristle
2 brush
3 brutal
1 brutality
1 bumpy

2 calm
1 careless
2 carpet
1 chaps
4 cloth
29 coarse
1 coarseness
1 cobblestones
1 cold
2 country
2 crooked
1 cross
1 cruel

1 desert
1 difficult
1 dirt
3 disagreeable
1 discomfort
1 discouraging
1 dog
1 dress
3 dry
1 dull

2 earth
2 easy
2 even

1 face
1 fast
7 file
2 fine
6 floor
2 football
1 forest

1 gambler
1 genteel
8 gentle
1 girl
1 granite
1 granular
1 grater
1 grating
1 gravel
8 ground

1 hairy
1 hall
2 hand
38 hard
1 hardness
10 harsh
1 harshness
1 haste
2 hill
2 hills
5 hilly
1 horrid
1 house

8 ice
1 impertinent
1 injurious
2 iron
2 irregular

1 jagged

1 knife

1 lake
1 land
3 level
1 luck
1 lump

8 man
1 manner
1 manners
1 material
1 me
1 mean
3 mild
6 mountain
1 mountains

1 nice
1 noisy

1 obstetricians
27 ocean
1 orange

1 paper
1 pavement
1 peasant
1 pebbles
2 person
1 picture
1 pineapple
2 plane
1 plank
1 play
1 poor
1 porcupine
1 push

1 quality
1 quiet
1 quite

1 radiator
5 ragged
1 railway
1 rasp
5 ready
1 refined
1 rider
1 riders
1 river
21 road
5 roads
10 rock
10 rocks
12 rocky
1 rowdy
1 ruddy
7 rude
1 rudeness
1 rug
22 rugged
1 ruggedness
1 Russian
1 rut

5 sand
13 sandpaper
1 savage
15 sea
1 sedate
1 scratch
1 shock
1 sliver
1 slow
346 smooth
3 smoothness
4 soft
1 sponge
1 stern
1 sticky
12 stone
8 stones
7 stony
5 storm
1 stormy
1 straight
8 street
6 surface

4 table
1 tempestuous
1 tongue
2 touch
2 tough
1 towel
4 tramp
1 trouble
1 tumble
1 turbulent

4 ugly
4 uncomfortable
4 uncouth
1 uneasy
33 uneven
1 unfairness
1 unfinished
7 unpleasant
1 unsatisfactory
1 untaught

1 voices
2 voyage
5 vulgar

2 walk
1 wall
1 washing
21 water
5 waves
1 weary
4 weather
1 west
2 wild
2 wind
1 winds
7 wood
1 woodsman
1 work
1 world
1 wrong

32. CITIZEN

14 alien
5 America
85 American
3 Americans
1 army
1 arrived

4 belong
1 belonging
1 beloved
1 beneficial
1 bird
3 born
1 Brooklyn
1 brother
1 business

1 C.
1 candidate
1 capital
1 cat
1 cistern
1 citizeness
27 city
4 civics
2 civilian
4 civilized
1 clothes
1 club
1 commander
3 community
1 comrade
1 conspirators
1 constitution
1 cosmopolitan
1 countrified
17 country
7 countryman
1 criticise

1 democrat
2 duties
3 duty
1 dweller
1 dwelling

1 ear
1 election
1 eligible
2 emigrant
1 emigration

1 F.
1 faithful
1 farm
3 farmer
3 fellow
2 fellowship
1 fine
2 five
1 fool
1 foreign
19 foreigner
1 free
2 freeman
1 friend
1 friendship

1 gardener
8 gentleman
3 German
26 good
6 government
1 green

1 helper
3 home
2 honest
1 honor
2 honorable
3 human

1 I
1 immigrant
1 independence
1 Indian
4 individual
1 inhabit
23 inhabitant
1 invader
1 Italian

2 justice

1 K.
1 king

1 large
11 law
1 laws
3 lawyer
1 leader
1 leading
1 legislature
1 Lincoln
1 little
1 live
1 lives
3 loyal

7 male
278 man
1 manhood
6 mayor
1 me
5 member
2 men
1 merry
1 moral
1 Mr. A.
1 Mr. C.
1 Mr. S.
1 municipal
1 myself

1 name
1 nationality
25 native
1 natural
1 naturalization
5 naturalized
1 navy
1 near
3 neighbor
1 newspaper
4 New York
1 noble
2 nobleman
1 nonsense

1 obedient
1 obey
1 occupant
2 office
1 officer

1 old
1 orderly
1 outlaw

2 paper
2 papers
1 patrician
2 patriot
2 patriotic
1 peasant
41 people
64 person
1 plebeian
2 policeman

4 politician
1 politicians
8 politics
1 poor
4 president
1 proud

1 relative
3 republic
1 republican
2 residence
20 resident
1 respectable
1 revolution

1 righteousness
2 Roman
2 Roosevelt
1 ruler

1 season
1 ship
5 soldier
10 state
5 statesman
1 stationed
1 straight
5 subject

1 suburban
3 suffrage
2 suffragette

3 Taft
1 Tammany
1 taxes
1 Teddy
1 thoughtful
1 tough
5 town
5 townsman

2 undesirable

1 unit
19 United States
2 useful

2 village
13 vote
4 voting
35 voter

1 Washington
2 woman
2 work

1 years

33. FOOT

2 anatomy
2 animal
11 ankle
2 appendage
11 arm

1 baby's
1 base
1 bicycle
2 big
3 black
34 body
4 bone
5 bones
6 boot
1 bottom
1 broken
1 brown

1 careful
3 comfort
3 corn
2 corns

1 dainty
1 difficult
1 distance

1 expansive
9 extremity

1 finger
1 firm
1 flat
6 flesh
1 football
3 foundation

1 gear
1 girls
1 going
1 good
2 ground

185 hand
5 hands
7 head
3 heel
1 help
1 helper
1 horse
1 house
1 human
1 humility
1 hurt

3 inch
2 inches

4 kick
2 knee

1 labor
1 lame
14 large
64 leg
1 legs
2 length
68 limb
2 long

5 man
3 measure
10 member
1 mine
1 Miss F.
2 movement
1 music

1 nail
1 naked
2 necessity
1 needful

1 organ

1 pain
1 painful
2 part
1 pavement
3 pedal

1 pedant
1 pedestal
1 pedestrian
5 person
1 plaster

2 quadruped

1 rheumatism
1 right
1 rubber
4 rule
1 ruler
2 run

1 shape
146 shoe
17 shoes
4 short
1 size
1 skin
2 slipper
22 small
1 sole
3 sore
1 speed
1 stability
6 stand
1 standing

1 standard
6 step
1 stepping
2 stocking
1 stone
1 strength
1 strong
1 stumps
1 support
1 swiftness

1 three
5 tired
30 toe
41 toes
2 travel
1 trod
1 twelve
1 two

5 useful

1 velocity

106 walk
38 walking
1 warm

1 yard

34. SPIDER

1 abhorrence
1 afraid
38 animal
1 annoyance
3 ant
2 arachnida
1 arachnoid
1 awful

3 bee
2 bees
4 beetle
1 big
2 hird
20 bite
8 black
1 breakfast
58 bug
2 bugs
5 butterfly

1 camp
3 caterpillar
1 centipede
1 chills
1 climb
12 cobweb
2 cobwebs
1 country
14 crawl

1 crawls
11 crawling
1 crawly
2 creature
6 creep
1 creeps
7 creeping
1 creepiness
5 creepy
2 cricket
1 cringe
1 cross
1 crow
1 cunning

1 daddy-long-legs
1 danger
4 dangerous
2 dark
1 dirty
3 disagreeable
1 displeasure
1 dread

1 evil

3 fear
1 fish

4 flies
136 fly
1 fright
1 fry
1 frying

1 grass

1 harlequin
1 harmful
1 horrible
4 horrid
3 horror

1 industry
276 insect

1 jumping

5 large
3 leg
27 legs
1 loathsome
1 long

1 Miss Muffet
1 mosquito
1 moth
1 movements

3 nasty
1 nest
2 net
1 nuisance

1 objectionable
1 obnoxious
1 octopus

1 pain
1 pan
1 pest
10 poison
1 poisonous
1 pretty

1 rats
2 Robert Bruce
1 roach
1 room

1 shivers
1 shudder
1 sinister
2 small
1 snake
1 snakes
1 sparrow
7 sting
1 stings

1 stung
1 study

3 tarantula
1 thing
2 thread
1 tortoise
1 treachery
1 tree

6 ugly
1 undesirable
1 unpleasant

2 venomous
1 vermin

1 walk
1 wall
6 wasp
1 watching
2 weaves
1 weaving
188 web
3 webs
1 wiggly
4 worm

1 young

35. NEEDLE

3 article

1 blood
2 book
1 broken
1 button
1 buttons

1 camel
4 cloth
2 clothes
2 coat
7 cotton
1 crocheting
1 cut

4 darning
1 diligence
2 dressmaker

1 embroidery
17 eye

3 fine

1 handy
1 help
1 hole
1 home
1 housewife
2 hurt
2 hypodermic

5 implement
2 industry
26 instrument

4 knitting

1 labor
1 long

1 magnetic
1 material
1 mending
3 metal

1 nail

1 ornament

1 patching
147 pin
11 pins
1 pincushion
49 point
9 pointed
10 prick
1 pricks
2 pricking

134 sew
1 sews
107 sewing
152 sharp
4 sharpness
1 shiny
1 slippers
2 small
53 steel
2 sting
1 stitching
1 surgeon

1 tailor
2 thick
15 thimble
2 thin
160 thread
5 tool

1 use
1 using
12 useful

1 weapon
1 wire
1 woman
6 work

36. RED

1 aggravating
1 anarchist
2 anger
13 apple
3 apples

1 ball
1 banner
2 barn
2 beauty
1 becoming
61 black
71 blood
1 bloody
1 blossom
99 blue
8 book
1 bravery
3 brick
2 bricks
40 bright
2 brightness
3 brilliant
1 brook
7 brown
1 building
2 bull

1 cap
1 cape
1 carpet
1 ceiling
1 cheeks
1 cheer
1 cherries
1 closet
8 cloth
1 clouds
2 coat
254 color
1 colors
1 colored
1 coloring
1 comfortable
1 Cornell
1 cow
2 crimson
2 curtain

14 danger
6 dark
1 dashy
1 dislike
18 dress

1 eat
1 Ed

2 fiery
31 fire
16 flag
3 flannel
1 flashy
1 fright
2 flower
1 flowers
1 flushing

1 garment
3 garnet
1 gaudy
2 glaring
1 glass
1 globe
1 glow
1 grass
30 green

6 hair
1 handsome
1 hat
2 head
1 healthy
4 heat
1 Hereford
1 holly
1 hood
1 horse
5 hot
2 house

2 Indian
4 ink
1 iron

1 jacket

1 lavender
1 light
1 lips

1 maroon
1 Mars
1 mixture
1 moon

1 object
1 objectionable
1 offensive
1 orange

5 paint
4 paper
1 passion
1 pencil
1 pink
1 plush
1 poinsettia
2 pretty
6 purple

2 ribbon
1 riding
2 robin
15 rose
2 rosy
2 rug

3 scarlet
1 shoe
2 sky
1 smooth
1 soldier
1 spots
1 story
5 sun
3 sunset
1 sweater

1 tablecloth
4 thread
1 tie
1 tomatoes
2 turkey

1 vivid

1 war
6 warm
3 warmth
1 whiskey
97 white
1 wool
1 world

1 yarn
15 yellow

37. SLEEP

94 awake
1 awaking
3 awaken
1 awakening

2 baby
1 beautiful
75 bed
1 bedstead

2 calm
1 chance
2 child
1 children
1 coma
30 comfort

2 dead
7 death
5 deep
1 desire
1 desperate
1 dope
2 dormitory
1 dose
4 doze
28 dream
10 dreams
6 drowsy
3 drowsiness
1 dullness

3 ease
4 easy
4 eat
1 enjoyable
1 enjoyment
1 enough
1 experiment
10 eyes

1 fast
2 fatigue
1 fine
2 forgetfulness

1 gentle
1 girl
1 go
5 good

1 habit
1 happiness
3 health
1 heavy
1 home

2 insomnia

1 lady
1 leisure
1 lain
3 lie
1 lying
1 luxurious
1 luxury

1 mesmerism
1 midnight
1 myself

1 natural
4 necessary
1 need
1 needful
1 nice
49 night

1 peace
1 peaceful
2 peacefulness
1 perfect
5 pillow
3 pleasant
1 plenty

1 poorly
1 potassium bromide
2 profound

8 quiet
2 quietness
1 quietude

1 rage
2 recline
1 reclining
7 refreshing
2 refreshment
1 relax
31 repose
300 rest
14 resting
9 restful
4 restless
1 restore
2 restorer
1 retiring
1 rise
1 rising
1 senses
1 Shakespeare
1 sheet
1 shut
1 silence
1 sleeplessness
1 sleepy
20 slumber
2 slumbering
4 snore
1 soft
1 solace
1 song
2 soothing
16 sound
3 soundly
2 still
3 sweet

1 thinking
26 tired
1 tiresome

12 unconscious
7 unconsciousness
60 wake
4 wakefulness
1 wakened
1 wakening
4 waking
2 walk
1 wanting
1 watchful
3 weariness
1 weary
1 well
1 woman

38. ANGER

1 abuse
1 aggravated
2 aggravation
1 agony
2 amiability
1 amiable
6 angry
2 anguish
1 annoyance
3 annoyed
1 appearance
1 aroused
1 awful

13 bad
2 bitter
3 bitterness
1 blow
1 blows
1 blush
8 boy
1 breathing

7 calm
1 calmness
2 cat
1 catching
2 cause
1 character
1 cheer
1 child
1 children
1 choler
1 cold
8 command
1 compose
5 control
1 cool
1 cranky
1 crazy
44 cross
2 crossness
1 covetous
1 cruel
1 cry

1 danger
1 deliberation
1 despise
1 devil
4 disagreeable
1 disappointed
2 disappointment
3 discomfort
1 dishonor
1 dislike
1 disobedience
1 disobedient
2 displeased
2 displeasure
3 disturbance
5 disturbed
4 dog
1 downhearted
1 duel

3 emotion
2 enemy
1 energy
1 enmity
1 excitability
3 excited
4 excitement
1 exclamation

1 face
1 father
9 fear
4 feeling
1 ferocity
1 fierce
1 fiery
8 fight
1 fighting
1 fist
1 flush
1 foolish
3 foolishness
1 force
1 forgive
3 forgiveness
1 frenzy
1 fret
1 fright
1 frown
1 frowning
1 fun
2 furious
4 fury

2 gentle
3 gentleness
1 giant
1 girl
4 glad
2 gladness
2 good
1 great
3 grief
1 grieve
2 grouchy

4 happiness
2 happy
3 harsh
2 haste
3 hasty
9 hate
1 hateful
26 hatred
1 headache
1 horrid
1 horror
3 hot
1 hot-headed
1 house
1 humor
1 hunger
1 hysteria

1 ill
4 impatience
3 impatient
1 Indian
1 indignant
2 indignation
1 insanity
1 insult
1 insulted
1 intense
1 intensity
1 intoxication
2 ire
1 irritable

1 jealousy
1 Jimmy
4 joy
1 joyful
1 judgment

2 kind
2 kindness

1 laughter
1 light
2 lion
1 little
3 loud
5 love
1 low

121 mad
1 maddest
19 madness
2 malice
6 man
1 mean
4 meekness
1 mild
4 mind
2 mirth
2 myself

1 name
1 nature
1 nerves
1 nervous
1 never
1 nice
2 noise
1 noisy
1 none
1 nonsense
1 not
1 noticeable

1 obey
1 out
1 outrage

1 pain
51 passion
1 passionate
3 patience
6 peace
1 peaceful
1 peevish
2 person
1 placid
5 pleasant
4 pleasure
2 provocation
1 provoke
1 provoked
2 provoking

3 quarrel
2 quarreling
1 quarrelsome
4 quick
1 quickness
6 quiet
1 quietness
1 quite

16 rage
1 rarely
1 rashly
1 rashness
1 raving
1 reason
3 red
1 remorse
2 resentment
1 resistive
1 rest
1 restless
8 revenge
2 riled
3 rough
1 roughness
1 rude

1 sad
2 scold
2 scolding
1 scowl
1 sedative
1 selfishness
1 sharp
1 shorn
1 sick
1 sin
1 slow
2 smooth
1 sober
1 soft
1 soldier
1 sometimes
1 soothing
10 sorrow
1 spite
1 spiteful
1 storm
1 strike
1 strong
1 suffering
1 sulky
1 swear
1 sweetness
1 sword

1 talking
2 teacher
1 tears
149 temper
1 temperament
1 terrible
1 terror
3 thought
1 torment
6 trouble
1 turbulent
1 turmoil

1 ugliness
4 ugly
1 unbecoming
1 uncomfortable
1 unhealthy
4 unpleasant

1 very
3 vexation
13 vexed
1 vicious
1 violence
2 violent
1 voice

1 war
5 wicked
1 wickedness
1 wish

4 woman
1 words
52 wrath
1 wrathful
2 wroth
4 wrong

1 yelling

39. CARPET

1 appearance
1 article

1 beat
2 beating
1 beater
2 beautiful
1 beautifying
2 beauty
1 bedroom
2 blue
2 bright
1 broom
2 brown
1 brush
1 brushes
14 Brussels

1 chair
1 chairs
3 clean
2 cleaning
1 cleaner
20 cloth
6 color
1 colors
15 comfort
3 comfortable
2 cotton
27 cover
76 covering

1 curtains

1 dark
6 design
1 designer
2 dirt
1 down
1 drag
1 dullness
4 dust
1 duster

3 ease
1 electric
1 expense

2 fancy
3 figure
1 flat
6 floor
2 floorii
2 foot
1 fur
1 furnishing
4 furniture

1 germs
2 good
4 goods
1 grain
1 gray

8 green

1 hall
3 heavy
4 home
4 house

2 ingrain

1 lay
1 loom
1 lot
3 luxury

6 mat
3 material
10 matting
1 mattress
1 microbes
1 moss

1 nail
1 neatness
2 nice
1 none

7 oilcloth
1 oriental
2 ornament

3 parlor

1 pattern
1 pennant
1 pleasant
2 plush
4 pretty
2 protection

1 quick

7 rag
3 rags
1 ragged
8 red
1 reddish
1 refinement
1 rich
17 room
2 rough
163 rug
14 rugs

1 shoes
1 small
8 smooth
78 soft
4 softness
2 stairs
1 stove
1 straw
7 sweep
3 sweeping

10 sweeper

1 table
8 tack
3 tacks
2 tapestry
2 textile
2 thread
2 tread

2 use
1 useful

9 velvet

15 walk
6 walking
1 wall
1 Wanamaker
2 warm
5 warmth
1 weaver
1 weaving
1 wear
1 white
1 wide
1 wood
10 wool
7 woolen
1 worsted
2 woven

40. GIRL

1 ankles
1 Annie
1 associate

1 baby
1 Beatrice
8 beautiful
6 beauty
9 being
1 belt
1 big
1 biped
1 blonde
1 blooming
1 book
350 boy
3 boys
2 braids
1 bright

1 changeable
1 cheerful
49 child
2 children
2 childhood
1 childish
1 choice
1 class
1 classmate
1 clever
4 clothes
1 clothing
1 Coleen
1 college
2 companion
1 cook
1 cunning
2 curls

2 cute

2 dainty
1 damsel
1 dance
1 dancing
2 daughter
1 delight
1 diabolo
1 domestic
1 Doris
1 Dorothy
1 dream
8 dress
4 dresses

1 Effie
1 Ethel
1 eyes

1 fair
2 fellow
77 female
3 feminine
3 flesh
1 flirtation
1 Frances
7 friend
1 futurity

1 garden
1 gay
1 gentility
1 gentle
1 Gertrude
6 good
1 grace

3 hair
1 hand
5 handsome
1 happiness
1 harmlessness
1 has
3 hat
1 head
1 here
1 hood
1 hoop
7 human
1 humanity

1 immature
2 infant
3 innocence
1 innocent
1 intelligent
1 Irene

1 jealousy
2 jolly
2 joy

1 kid

20 lady
1 large
1 lassie
1 learning
3 little
1 lively
1 Lizzie
3 love
1 loving
4 lovely

7 maid
13 maiden
1 maidenh
1 male
7 man
1 men
1 meek
1 mischiev
4 miss
1 Miss S.
1 modesty
2 mother
2 myself

2 neat
2 necessity
11 nice
2 niece
1 noise

1 Pelar
18 person
1 petticoats
2 play
4 pleasure
29 pretty
1 pupil

1 quick
1 rarely
1 running

1 saucy
19 school
3 servant
4 sex
1 shirk
4 silly

6 sister
2 sixteen
1 skirts
1 slender
1 slight
1 slim
8 small
1 smart
1 smartness
1 student
1 studious
3 study
1 stylish
1 summer
4 sweet
1 sweetness
2 sweetheart

1 talks
4 tall
1 thoughtless

1 ugly
1 useful

1 vanity
2 virgin

1 walk
1 water
2 weak
1 white
1 wife
61 woman

31 young
1 youngster
24 youth

41. HIGH

9 above
5 air
1 Alps
14 altitude
1 ascend

1 bank
1 beam
1 beanstalk
3 big
1 bridge
24 building
2 buildings

1 Cathedral
4 ceiling
2 chair
2 church
1 cliff
1 climb
1 climbing
7 clouds

5 deep
4 depth
1 dimension
11 distance
3 distant
2 dizzy

11 elevated
2 elevation
1 erect
2 exalted
1 extended

3 fall
2 falling
1 far
1 fast
2 fear
1 feet
8 fence
1 first

2 giant
1 great

1 hat
1 heaven
3 heavens
1 heavenward
14 height
20 hill
4 hills
1 hot
24 house
1 houses

1 ideal
1 ideas
1 immense

2 jump

1 kite
2 ladder
5 large
7 length
1 lighthouse
20 lofty
7 long
328 low

1 magnificent
1 man
2 mast
1 measure
3 medium
1 Metropolitan
1 mind
2 monument
1 mount
157 mountain
16 mountains
1 myself

1 notion

4 peak
1 pine
1 pinnacle
1 play
8 pole
1 power
3 precipice

2 reach
1 rich
1 rocky
3 roof
1 room

1 see
1 shallow
3 short
1 skies
17 sky
2 skyscraper
1 small
1 soft
1 spire
1 staff
1 stand
13 steep
12 steeple
1 stick
1 stone
1 summit
2 swing

57 tall
1 temperature
1 temple
5 top
12 tower
19 tree
4 trees

26 up
1 upward

1 valley
1 vision

5 wall
1 waves
2 wind
1 woman

42. WORKING

1 accomplish
1 accomplishment
3 active
1 activity
1 always
1 ambition
5 ambitious
1 anxious
1 apron
1 attendant

1 bent
1 book
2 boy
2 broom
6 business
51 busy

1 carpenter
3 class
1 comfort
1 complication
2 content
2 continually
1 continuous
1 cooking

6 day
1 difficult
1 digging
1 diligence
1 discomfort
2 do
10 doing
1 done
1 drawing
1 driving
1 drudge
1 dusting
1 duties
2 duty

2 earning
2 ease
1 easiness
4 easy
2 eating
1 effort
10 employed
1 employers
4 employment
2 energetic
8 energy
2 engaged
1 English
1 essay
15 exercise
1 exercising
3 exertion

3 factory
2 fair
1 faithfully
1 farm
1 fast
3 father
7 fatigue
2 fatigued
1 field
1 flowers
1 foundry
1 function

2 girl
4 good

2 hammer
3 hands
1 happiness
105 hard
2 health
1 healthy
1 hoeing
2 horse
1 hour
1 house

44 idle
10 idleness
2 idling
1 inconvenience
1 indolent
13 industrious
8 industry
1 intelligent
1 interest
2 Italian
1 job

1 keeping

147 labor
20 laboring
1 labors
5 laborer
1 lack
1 ladies
1 late
2 laziness
18 lazy
1 leisure
1 Lillie
1 little
1 live
2 livelihood
5 living
1 loaf
5 loafing
1 loafer
1 lounging

2 machine
1 machinery
1 machinist
1 making
50 man
6 men
1 model
4 money
1 morning
3 motion
2 movement
5 moving
1 mowing
2 myself

4 necessary
1 necessity
1 neighbor
1 never
1 night
1 noble
1 nothing
1 nursing

1 obstetrics
13 occupation
1 occupied
1 occupy
2 order

1 paid
1 patients
5 people
2 person
1 perspiration
8 play
22 playing
1 pleasant
4 pleasure
1 plow
1 plowing
1 policy
1 position
1 possession
1 prosperous

1 quick

1 railroad
1 reading
1 recreation
17 rest
24 resting
1 result
1 rowing
3 running

1 salary
1 satisfaction
1 saving
6 school
3 scrubbing
2 servant
1 setting
7 sewing
2 shirking
7 shop
1 shorthand
1 sickness
1 singing
3 sitting
4 slave
1 slavery
1 slaving
2 sleep
8 sleeping
1 slow
1 smart
1 starving
2 steady
1 stenographer
2 strenuous
1 struggle
5 study
5 studying

1 sweep
8 sweeping
1 swift

1 table
2 task
1 thinking
1 thought
1 time
28 tired
3 tiresome
1 tiring
1 to-day
7 toil
9 toiling
2 tools
1 treadmill
1 trouble
2 trying
1 typewriter

2 unemployed
2 useful

4 wages
2 walking
1 washerwoman
5 washing
1 weariness
2 willing
2 woman
1 work
1 workman
1 world
2 writing

43. SOUR

1 acetic
23 acid
1 acrid
1 anger
1 angry
27 apple
10 apples
1 astringent

6 bad
1 beer
70 bitter
1 bitterness

3 cherries
2 cider
1 cross
1 crowd
1 currants

1 dangerous
1 death
1 delight
18 disagreeable
1 dislike
3 disposition
4 distasteful
1 drink

1 face
1 flavor
3 fruit

1 gall
4 good
1 goodness
3 grape
36 grapes
2 grapefruit
1 green

1 hate
1 hurts

1 juice

2 kraut

78 lemon
17 lemons
1 lime

1 man
31 milk

3 nasty
1 naturally
3 nice
1 no
1 nourishing

1 odor
2 orange

1 painful
1 persimmon
15 pickle
26 pickles
1 pleasant
1 plum
1 plums
8 pucker

3 quince

1 rancid
1 repulsive
5 rhubarb
1 rough

2 salt
1 salty
2 sauerkraut
1 sear
2 sharp
1 soft
1 song
1 spoiled
1 stomach
2 sugar
349 sweet

17 tart
65 taste
2 tasting
2 tasteless
1 teeth
1 turned
1 twinge

4 ugly
1 unhappy
3 unpalatable
16 unpleasant
1 unpleasantness
1 unsweetened

91 vinegar

1 wholesome
1 wine

44. EARTH

1 agriculture
8 air
1 ashes

4 ball
3 beautiful
2 big
7 black
1 body
2 broken
17 brown
1 building

1 cemetery
71 clay
1 climate
1 cloud
1 coffin
2 cold
1 color
2 Columbus
1 continent
2 corn
2 country
1 cover
1 creation
1 crunching
1 crushed
6 crust

6 damp
10 dark
1 delve
2 depth
1 dig
2 digging
115 dirt
4 dirty
1 dogs
4 dry
9 dust

3 farm
1 farming
1 fence
1 fertile
1 fertilized
4 field
1 fields
1 flag
3 floor
1 flower
8 flowers
1 foot
1 foundation
1 fresh
1 fruitful
1 Fuller's

8 garden
1 geranium
16 globe
2 grain
1 grand
11 grass
3 grave
2 gravel
1 gravity
2 great
3 green
1 greenhouse
166 ground
1 growth

2 habitation
4 hard
31 heaven
1 heavens
2 heavy
1 hell
1 hemisphere
3 home
1 house
1 huge

1 inhabitable

28 land
7 large
1 level
3 live
2 living
3 loam
1 lot
2 low

1 man
2 map
3 Mars
1 mass
1 material
1 matter
1 metal
1 mine
1 mineral
3 moist
11 moon
5 mother
2 mould
1 mouldy
4 mountain
2 mountains
16 mud

4 nature

1 object
1 ocean
1 one
1 orange

1 paradise
1 place
17 planet
2 plant
5 plants
1 planting
1 pleasure
1 potential
1 productive
1 put

1 rain
1 rampart
1 rest
1 revolution
4 rich
1 river
1 road
2 rock
2 rocks
61 round
1 roundness
5 sand
81 sky
1 smelly
3 smooth
2 sod
5 soft
37 soil
1 solid
2 solidity
1 space
4 sphere
1 star
2 stone
2 stones
1 street
1 substance
4 sun
3 surface

1 travel
4 tree
5 trees

1 unfertile
8 universe

1 vastness
1 vegetable

3 walk
10 water
1 wide
1 wood
46 world
5 worm
2 worms

45. TROUBLE

2 accident
4 affliction
3 aggravation
6 anger
6 angry
1 anguish
1 annoy
2 annoyed
5 annoyance
15 anxiety
2 avoid

11 bad
1 begins
1 black
1 borrowed
1 borrows
4 bother
2 bothered
1 bothersome
1 brains
1 brewing
1 broke
1 burden
1 burdens
1 business
1 busy

1 calm
1 calmness
27 care
3 cares
1 careless
4 children
1 college
6 comfort
1 comforts
1 comfortable
2 coming
1 consequences
2 contented
1 contentment
1 court
1 cry
1 crying

6 danger
1 darkness
1 day
16 death
2 deep
2 despair
1 difficult
1 difficulties
1 difficulty
1 disagreeable
2 disagreement
1 disappoint
3 disaster
7 discomfort
2 discontent
3 disease
2 dislike
1 disobedience
1 displeased
1 displeasing
2 displeasure
1 dissatisfactory
7 distress
2 disturbed
1 doctor
1 dogs

4 ease
1 easiness
1 easy
1 ended
1 enemies
1 enemy
1 error
1 everywhere
1 exams
1 excited
2 excitement

3 family
1 father
3 fear
1 feeling
1 few
5 fight
2 fighting
1 flunking
1 fret
1 friends
1 fun
1 funeral
3 fuss

2 girl
2 gossip
2 great
26 grief

1 handkerchief
19 happiness
8 happy
5 hard
6 hardship
1 harm
3 health
1 heart
1 heaviness
1 hemorrhage
2 home
1 horror
1 horse
1 hurried
1 husband

1 idea
2 illness
1 imaginary
2 inconvenience

9 joy

1 kindness
1 kinds

1 labor
1 laugh
1 lawyer
1 lessons
2 life
1 little
1 lonesome
1 loss
5 lots

2 mad
1 madness
5 man
1 many
2 marriage
2 me
10 mind
1 minded
3 mischief
1 miserable
14 misery
6 misfortune
1 misunder-standing
4 money
1 monotony
1 mother
1 Mrs. Wiggs
5 much

1 nervousness
3 no
2 noise
4 none
1 nuisance
20 pain
2 patience
2 patient
1 patients
15 peace
3 peaceful
3 people
1 perplexed
1 perplexity
? person
1 pity
10 pleasure
1 plenty
2 poor
2 poverty
1 psychologist

3 quarrel
3 quarreling
3 quiet
1 quietness

1 release
1 relief
1 remorse
1 rest
2 reverses
1 Romeo
1 ruffled

6 sad
13 sadness
1 school
1 scrape
1 sea
1 seldom
1 sereneness
1 shadow
1 ship
1 shooting
47 sickness
1 simple
1 sin
1 sleep
1 sometimes
202 sorrow
1 sorrows
4 sorrowful
1 sport
1 squabble
1 study
1 suffer
1 suffering
1 sweetener
2 sympathy
1 table
1 task
9 tears
1 teasing
1 temper
1 temptation
2 thought
1 thoughts
1 torment
1 travel
1 trial
3 trials
6 troublesome

1 ugly
1 unavoidable
1 uncertainty
2 uncomfortable
6 uneasiness
6 uneasy
2 unfortunate
13 unhappiness
8 unhappy
1 unlucky
2 unnecessary
5 unpleasant
3 unpleasantness
1 unrest
1 unsafe
2 unsatisfactory
1 unsettled
2 upset

1 want
2 war
1 weak
3 weary
2 weeping
1 welfare
1 woe
5 woman
1 women
8 work
1 worked
1 working
3 worried
2 worries
65 worry
1 worrying
5 worriment
2 wrinkles
2 wrong

1 yesterday
1 youth

46. SOLDIER

1 academy
1 armies
137 army
3 arms
1 Arnold
2 artillery

1 baseball
8 battle
1 bayonet
1 blood
1 blue
23 boy
1 boys
46 brave
1 braveness
8 bravery
1 Brazilian
1 brother
2 buttons

4 cadet
2 camp
2 cannon
1 cap
8 captain
3 cavalry
14 citizen
3 civilian
1 clothes
1 colonel
6 command
1 commanding
3 commander
1 costume
4 country
5 courage

1 danger
2 defender
1 defense
2 discipline
1 disliked
1 double
2 drill
1 drums
4 duty

1 enemy
1 England
1 English
3 erect

1 fellow
17 fight
1 fights
12 fighter
12 fighting
1 firearm
2 fort
1 fortune

4 general
1 Germany
1 glory
3 good
1 Grant
8 guard
1 guardian
1 guardsman
27 gun
2 guns

1 helmet
8 hero

1 him
1 hobo
1 home
1 hurt

2 infantry

1 jacky
1 Jim

1 king

5 lieutenant

3 male
189 man
4 men
1 manly
12 march
5 marching
1 marine

2 marshal
2 mechanic
17 military
3 militia
1 murder
1 music
2 musket

1 N.
1 nation
1 national
2 navy
1 necessary
1 nobility

1 obedience
1 obey
12 officer
1 officers
1 order
2 orderly

5 patriot
1 patriotic
1 patriotism
3 person
1 Philippines
1 police
6 policeman
1 protection
2 protector
1 proud

4 red
1 redcoat
1 regiment
2 regular
1 respectable
1 Richmond
3 rifle

58 sailor
1 sailors

1 salute
1 sentry
1 servant
1 service
1 show
1 sick
1 single
1 smart
1 sorrow
1 stateliness
1 store
3 straight
1 strength
1 strenuous
1 strict
4 strong
2 sword

2 tall
1 tent
4 tin

1 training
1 travel
1 troop
1 troops

39 uniform
1 United States
3 upright
1 uprightness

1 valiant
3 veteran
3 volunteer

94 war
1 warfare
12 warrior
3 West Point
2 widow
2 work

47. CABBAGE

1 away

1 bad
2 beans
11 beef
1 beet
2 beets
1 boiled
1 broth
1 bud
1 bunchy

2 carrot
1 carrots
1 catsup
17 cauliflower
1 cigar
1 cold-slaw
1 cook
4 cooking
1 corn
1 cucumbers
1 cut

1 decayed
1 disagreeable
2 dish
1 dislike
4 dinner

30 eat
6 eating
6 eatable
3 eatables

11 farm
1 farming
3 field
2 fields
1 fine
4 flower
22 food
7 fruit

43 garden
1 German
1 Germans
1 goat
13 good
44 green
3 greens
3 ground
1 grow
1 grows
2 growing
1 growth

1 ham
3 hard

30 head
1 heads
1 healthy
2 heavy
1 herb
1 home
2 horrid

8 indigestion

1 kale
2 kraut

8 large
9 leaf
11 leaves
11 letters
1 lot

2 meal
8 meat
2 Mrs. Wiggs
1 mustard

1 nice
1 nothing

2 odor
2 onion

3 onions

1 paper
1 parsley
16 patch
48 plant
3 plants
1 plantation
1 planted
1 planting
1 plate
5 pork
5 potato
18 potatoes
1 purple

1 quart

2 rabbit
3 red
2 rose
4 round

5 salad
17 sauerkraut
2 slaw
11 smell
1 soapy
2 solid

2 soup
4 sour
1 spice
1 spinach
1 sprouts
3 stalk
1 stew
1 stinking
1 strong
1 sustenance
3 sweet

8 taste
1 tender
2 tomato
2 tomatoes
20 turnip
6 turnips

1 unnecessary
1 unwholesome

1 Valhalla
394 vegetable
10 vegetables
4 vinegar
1 Virginia

1 white

48. HARD

2 adamant
8 apple
1 apples

2 bad
5 ball
1 baseball
1 bed
1 bench
1 blackboard
6 board
2 boards
1 bone
1 bread
1 break
12 brick
2 brittle
2 bullet

2 cabbage
1 callous
2 candy
1 can't
8 chair
1 character
7 coal
1 coarse
1 cold
1 crystallized

1 dense
3 diamond
5 difficult
1 disagreeable
1 do
1 durability

1 earth
1 earthen
17 easy
2 egg
1 eggs
1 examination

1 face
1 farmer
1 feary
4 feeling
11 firm
2 firmness
1 fist
4 flint
16 floor
1 formidable
1 fruit

2 glass
1 glittering
1 gold
2 good
1 granite
2 ground

1 hammer
2 harsh
2 heart
2 hearted
2 heavy
1 hickory
1 hurt

8 ice
1 immovable
1 impenetrable

1 indestructible
1 individual
1 indurated
1 inflexible
1 injustice
1 irksome
44 iron

1 kind

1 labor
2 lead
2 lesson
1 lignum-vitae
2 life
1 low
3 luck

1 maple
8 marble
1 mathematics
2 mean
2 medium
5 metal
1 murder
1 mush

1 nail
1 nails
1 natural
1 nut
1 nuts

1 oak
1 opaque

2 pavement
1 perplexing
1 physics
1 piano
1 principle
1 pulpy

1 quality
1 questions

1 raining
4 resistance
1 resistant
1 rigid
1 road
88 rock
4 rocks

1 rocky
11 rough

1 saltpetre
1 severe
1 sidewalk
15 smooth
367 soft
15 solid
1 stale
14 steel
1 stick
1 stingy
102 stone
1 stones
1 stony
2 stove

1 strength
4 strong
1 stuff
6 substance

5 table
1 tack
1 thick
1 tight
2 touch
12 tough
2 tree
1 trouble
1 turnip

5 unbreakable
5 uncomfortable

1 uneasy
1 unimpressionable
2 unpleasant
1 unpliable
1 unripe
1 unyielding
1 uselessness

1 very

1 walnuts
2 water
1 wisdom
66 wood
19 work
2 working

49. EAGLE

8 air
1 altitude
7 America
12 American
4 animal
1 aspiring

1 bald
8 beak
2 beast
2 bill
568 bird
6 birds
1 birdie
1 black
1 butterfly
2 buzzard

1 carnivorous
1 carrion
1 chickens
2 claws
1 clouds
1 contour
1 crag
3 crow

1 cruelty

4 dollar
5 dove

1 eggs
8 emblem
12 eye
1 eyed
1 eyry

1 falcon
7 feathers
1 fierce
2 flag
6 flies
22 flight
1 flint
46 fly
23 flying
2 flyer
8 fowl
8 freedom

1 glare
1 glorious
2 golden

1 graceful
1 gray
1 great

13 hawk
1 height
21 high

1 insect
1 insignium

1 keen
4 king

9 large
1 lark
1 liberty
2 lofty

2 might
14 mountain
8 mountains

12 nest

4 owl

8 paper
1 parrot
1 partridge
1 peacock
2 pigeon
2 power
5 prey

1 quail
1 quarry

1 robin
1 rock

1 scarce
3 sharp
1 sight
2 sky
2 sly
5 soar
3 soars
14 soaring
1 solitude
1 space
6 sparrow
1 sport

1 spread
11 strength
3 strong
1 sun
8 swallow
1 swan
4 swift
1 swiftness
1 sword

1 talon
1 talons
1 tern
1 Times
1 turkey

2 United States

8 vulture

8 wing
16 wings

1 young

2 Zoo

50. STOMACH

82 abdomen
81 ache
21 anatomy
2 animal
5 appetite
1 apples
2 arm

1 back
1 bad
7 bag
1 basket
2 beast
1 beef
6 belly
1 belt
1 biology
99 body
13 bowels
1 brain
1 bread
1 breast

8 cancer
1 care
2 careful
1 cat
1 cavity
1 chart
18 chest
1 coil
2 condition
1 contain

1 delicate
1 diaphragm
6 digest
1 digesting
50 digestion
8 digestive
2 digests
7 dinner
1 disease
1 distress
2 doctor

1 dress
1 duodenum
4 dyspepsia

46 eat
27 eating
8 empty
1 engine
1 excellent

1 face
1 fat
1 feed
1 feeding
1 feet
102 food
2 foot
1 flesh
1 frame
1 front
7 full
1 function

5 gastric
1 Gertrude
4 good
1 grind
2 grinding

2 hand
1 hands
9 head
5 health
24 heart
1 hog
6 hunger
6 hungry
2 hurt
1 hurts
1 hygiene

1 illness
17 indigestion
5 inside
2 interior

2 internal
28 intestine
82 intestines

1 juice

4 large
1 leg
1 limb
13 liver
1 living
1 lung
3 lungs

1 machinery
5 man
1 meal
1 meals
5 member
1 milk
1 mortal
8 mouth
1 muscle

2 nausea
3 necessary
1 necessity
1 neck
1 nuisance

1 object
1 oblong
4 œsophagus
81 organ
3 organs
1 overeating
1 overloaded

28 pain
3 part
9 person
8 physiology
1 picture
2 poor
1 portion
4 pouch
1 psychology
3 pump
2 punch

1 receiver

3 receptacle
2 reservoir
1 rest
3 round

1 self
10 sick
7 sickness
1 skin
2 small
4 soft
1 sore
2 sour

1 specimen
1 strong
1 suffer
1 suffering
1 sustenance
2 system

1 tender
1 tenderness
1 thought
1 throat
2 tongue
25 trouble
1 troubles

5 troublesome
1 trunk
3 tube

1 upset
1 useful

2 vessel

1 want
1 water
3 weak
1 weakness
1 work

51. STEM

1 anything
1 appendage
43 apple
1 apples

1 base
8 beginning
1 blade
3 blossom
1 boat
1 body
1 brain
83 branch
1 branches
1 broad
1 broom
4 bud
5 bush
1 butt

2 cane
2 cherry
8 connection
1 connects
2 cord
2 core

10 end

1 ending
1 evolution

1 fibre
2 fibres
1 finger
259 flower
7 flowers
2 foundation
14 fruit

1 grass
9 green
3 growth

20 handle
1 hard
1 head
2 hold
1 holding
4 holder
1 holes

1 join

96 leaf
4 leaves

1 leg
3 length
1 lettuce
1 life
2 light
1 lily
4 limb
1 living
13 long

1 match

1 necessity

1 object
1 offshoot
1 organ

4 part
1 parts
1 particle
2 peach
9 pear
1 peduncle
3 pencil
4 petal
1 pick

3 piece
70 pipe
1 pit
74 plant
1 plow
6 point
1 poppy
1 projection
1 prop

1 reed
1 river
1 rod
27 root
1 roots
21 rose

2 shank
6 short
7 slender
1 small
1 smoke
1 soft
21 stalk
2 steps
6 stern
14 stick

1 stiff
1 stone
1 stop
1 storm
2 straight
8 support

4 thin
2 thorn
2 tide
1 tobacco
1 top
44 tree
2 trees
3 trunk
7 twig

1 valve
1 violet
3 vine

7 watch
2 water
3 weed
3 wind
2 winding
3 winder
4 wood

52. LAMP

1 Aladdin
1 arc
6 articles

5 black
1 blaze
1 brass
12 bright
3 brightness
20 burn
10 burning
3 burner
1 burns

13 candle
2 chandelier
1 cheer
87 chimney
1 convenience

1 crockery

1 dangers
3 dark
2 darkness
1 daylight
1 distance
1 dull

5 electric
1 evening

5 fire
1 flame
1 full
2 furniture

4 gas
1 glaring

8 glass
7 globe

3 high
1 home
1 hot
1 house

2 illumination

7 kerosene

1 lantern
2 large
1 library
650 light
2 lights
4 lighted
1 lighten
2 lit

1 match

1 nickle
4 night

49 oil
1 ornament

1 petroleum
5 post
1 pretty

2 reading
1 red
1 Rochester
2 room

2 see
37 shade

1 shadow
1 small
4 smoke
1 smokes
1 smoking
1 smoky
2 stand
1 stove
1 student

8 table
1 tall

2 useful

2 vessel

1 warmth
23 wick
1 wisdom

53. DREAM

1 absence
1 angel
1 angels
1 anger
1 anything
6 asleep
11 awake
1 awaking
1 awaken
3 awakening

2 baby
16 bad
4 beautiful
11 bed
3 bliss
1 book
1 boy

1 comfort
2 consciousness
1 conversation

1 dangerous
1 darkness
1 days
2 death
1 delusion
1 delusions
1 disagreeable
1 disappointment
1 discontent
2 disturbance
1 disturbing
1 doze
1 dread
2 dreary

1 easy
1 expectation
1 experiment

1 eyes

2 falling
9 fancy
1 fantasy
1 fear
1 feeling
1 feelings
1 forgotten
1 fortune
1 funny

1 girl
7 good
1 goodness
1 grand
1 grieving

2 hallucination
3 happiness
1 heaven
3 home
1 hope
3 horrible

1 idea
3 illusion
1 image
2 imaginary
12 imagination
5 imagine
1 imaginings
2 impression
2 indigestion
1 insanity
1 inspiration

1 kind

1 land
2 languid

2 lie
1 like
2 love

1 M.
2 man
1 mare
1 meditate
1 melancholy
1 melody
1 mesmeric
8 mind
1 money
1 music

2 nature
1 never
3 nice
42 night
24 nightmare
1 no
1 none
2 nonsense

1 object
1 omen
1 on
1 opium

1 paradise
1 patients
1 peace
2 peaceful
1 phantoms
3 picture
1 pillow
1 play
38 pleasant
13 pleasure
1 presentiment
1 prophesy

1 psychology
1 purple

1 queer
1 quiet

1 realization
1 recollection
1 relax
1 remember
2 repose
1 reposing
3 rest
6 restless
1 restlessness
2 reverie

2 sad
1 sadness
1 scene
1 second
1 semiconscious
1 sensation
1 sense
1 shade
1 shadows
1 short
2 sickness
1 sight
1 sights
330 sleep
39 sleeping
2 sleeper
2 sleeplessness
2 sleepy
1 slept
20 slumber
1 something
1 somnambulist
2 snore
1 soliloquy

1 stale
1 startling
1 story
14 sweet

1 talk
1 terrible
3 things
29 think
8 thinking
38 thought
22 thoughts
1 tiring
1 trouble
2 true

1 uncomfortable
1 unconscious
1 unconsciousness
1 uneasiness
2 uneasy
1 unfortunate
5 unpleasant
1 unpleasantness
2 unreal
2 unrest
1 unstable

1 vacancy
1 vagueness
48 vision
6 visions
1 vivid

9 wake
1 waking
1 wander
4 wandering
1 weird
2 wonder
1 woods
1 work

54. YELLOW

1 alive
2 amber
3 apple
1 autumn

5 banana
3 beautiful
2 beauty
1 becoming
8 bird
24 black
1 blossoms
41 blue
23 bright
2 brightness
1 brilliant
13 brown
1 buff
7 butter
11 buttercup
2 buttercups
8 butterfly

4 canary
1 cat
2 China
3 Chinaman
3 Chinee
2 Chinese
1 chrome
1 chrysanthemum
1 chrysanthe-mums
3 cloth

1 coarse
301 color
1 coloring
1 common
1 complexity
1 corn
2 cream
1 crocus

3 daffodil
3 daffodils
6 daisy
7 dandelion
6 dark
1 delightful
1 desert
1 disagreeable
1 dog
1 door
1 dream
9 dress
1 dresses
1 dull

1 ecru
1 egg

1 fade
1 fancy
1 fence
3 fever
4 flag
1 flame
38 flower

9 flowers
3 fruit

1 G.
1 garments
1 gay
1 glare
13 gold
5 golden
1 goldenglow
5 goldenrod
1 goods
1 gorgeous
1 grass
41 green

2 hair
2 house
1 hue

1 ink

2 jasmine
3 jaundice
6 jealousy
1 jonquil
2 journal

2 kid

2 leaf
1 leaves
7 lemon
14 light

2 lily

1 maize
1 man
1 marigolds
1 matter
1 mellow
1 melon
1 molasses

1 nature
1 nice

1 obnoxious
1 ochre
47 orange

5 paint
2 pale
3 pansy
4 paper
2 peach
1 pears
1 pillow
13 pink
1 plague
1 poppy
4 pretty
1 primrose
2 pumpkin
1 pumpkins
1 pure
5 purple

34 red
1 ribbon
9 rose

1 satin
1 school
1 sear
4 shade
1 silk
2 sky
2 soft
1 spectrum
1 suit
1 sulphur
21 sun
8 sunflower
7 sunlight
1 sunshine

1 table
2 tan
1 tarnish
1 tree

1 ugly
1 unharmonious

2 violet

1 wagon
1 warm
1 warmth
1 wax
1 wheat
70 white

55. BRE

1 appetite

2 bake
4 baking
3 baker
1 bakery
14 biscuit
2 biscuits
4 blue
1 board
1 box
2 breakfast
3 brown
1 buns
151 butter

15 cake
1 cheese
1 children
1 color
1 common
1 cookies
1 corn
1 crackers
1 crumbs
6 crust
1 cut

3 daily
4 diet
6 dinner
1 dish
26 dough
1 doughnuts

1 earn
148 eat
44 eating
28 eatable
6 eatables
1 edible

1 feed
88 flour
191 food
3 fresh
2 fruit

21 good
2 graham
2 grain

1 barn
1 hand
3 hard
2 heavy
1 holes
2 home
1 hot
7 hunger
4 hungry

8 knife

23 life
8 light
1 living
7 loaf
1 lunch

1 making
2 man
1 meal
5 meat
1 milk
1 mixing

1 necessary
2 necessity
1 needful
4 nourishment

1 oatmeal

1 pantry
1 pastry
1 plate
1 pudding

1 roll
2 rolls
6 rye

1 salt
1 salty
1 satisfaction
1 sister
8 soft
1 sour
8 staff
3 stale
1 strengthen
2 substance
1 substantial
1 sugar
1 sustenance
4 sweet

3 table
2 tea
1 toast
1 tough

1 useful

9 water
21 wheat
15 white
1 wholesome
1 wine
1 winner

8 yeast

56. JUSTICE

2 action
2 administered
1 administration
2 all
1 always
1 ask
1 authority

1 B.
1 bad
1 bed
3 blind
1 blindfolded
1 body

1 caught
1 charity
1 chastise
1 chief
1 clearness
1 comfort
3 command
1 commanding
1 conqueror
1 constable
64 court
2 courts
1 Creator
1 crime
1 criminal
2 cruelty

1 dealing
1 deeds
1 defying
1 delayed
1 demand
1 deserved
2 dispute
1 distribution
3 do
2 doing
1 done
1 Dr. E.
6 duty

1 elusive
1 emblem
1 employer
1 energy
3 equal
9 equality
1 equally
3 equity
2 even
1 exactness
1 execution

32 fair
21 fairness
1 favor
1 fear
1 fine
6 freedom
1 friendship

1 gift
1 give
8 given
3 God
1 godliness
14 good
2 goodness
1 govern
3 government
1 guilty

1 happy
1 harm
1 hasty
1 have
1 heaven
1 help
1 him
5 honest
3 honesty
7 honor

1 impartial
1 iniquity
1 injury
26 injustice
1 innocent

1 J.
2 jail
1 joy
1 judge
1 judged
6 judgme
3 jury
5 just
4 justified

6 kindness

1 lacking
1 large
74 law
2 lawful
4 lawyer
2 lenient
11 liberty
1 lots
1 love

2 magistrate
13 man
1 merciful
28 mercy
1 merit
1 mind
1 moral
1 mother

1 never
1 nobility
1 noble
1 none
1 nonsense

1 obey
1 obtain
1 oppression
4 order

1 pardon
4 partiality
143 peace
1 perfect
1 person
1 picture
1 Plato
1 police
1 policeman
1 politics
1 popular
1 power
1 privilege
1 purity

1 reason
2 reward
67 right
3 righteous
13 righteousness
1 rightly
1 rightness
11 rights
1 ruler
4 satisfaction
1 satisfied
1 satisfying
6 scales
2 severe
1 severity
1 sorrow
3 square
1 squareness
1 squire
4 statue
1 story
3 supreme
2 sure

1 tranquillity
6 true
14 truth
2 truthfulness

1 unbias
1 unfairness
1 unhappiness
8 unjust
1 uprightness

1 vengeance
3 virtue

2 well
1 wicked
1 willingness
2 wisdom
1 wise
2 work
8 wrong

1 yes
1 yield

57. BOY

2 action
2 active
2 activity
1 agility
8 animal
3 athletic
2 athleti'

6 baby
9 bad
10 ball
1 barefoot
5 baseball
1 beautiful
6 being
1 Ben
2 body
1 boisterou
1 book
2 bright
6 brother
2 busy

1 cap
1 careless
1 Charles
1 chicken
86 child
1 children
1 class
1 clothes
1 clothing
2 companion
1 cousin
1 curls

1 dead
1 development
2 dirty

1 dog

1 Edward
1 eighteen
1 embryonic
1 errand

1 fair
3 female
1 fight
1 flesh
1 foolish
1 football
1 Frank
4 friend
2 frolic
4 fun
1 funny

1 games
819 girl
7 good
1 grown
1 growth
2 gun

1 handsome
1 Harry
1 hat
1 head
1 hearty
1 hero
2 hood
2 hoop
9 human
1 humanity

1 imbecile
1 imperfect

1 incorrigible
1 industrious
2 infant
1 inhabitant
1 innocent

1 jacket
2 James
1 Jimmy
1 Joe
1 joyful
1 jump
1 jumper
2 juvenile

4 kid

7 lad
2 large
1 laugh
1 legs
2 life
8 little
3 lively

1 maid
63 male
104 man
1 manhood
1 mankind
1 manliness
1 manly
1 marbles
8 masculine
2 master
1 meanness
1 Michael
11 mischief
7 mischievous

1 mother
1 muscles
1 myself

1 naughty
2 Ned
1 nephew
1 newspaper
8 nice
7 noise
3 noisy
1 nuisance

1 obedient
1 out

6 pants
1 Paul
11 person
20 play
1 plays
1 playful
1 playfulness
2 pupil

6 rough
1 running
1 runs

1 scallywag
2 scamp
1 scholar
11 school
4 sex
1 sharp
2 shoes
14 small
2 smart
1 smiles

8 son
1 spirit
1 spoiled
2 sport
1 street
2 strength
3 strong
2 suit
1 sweetheart
1 swimming

8 tall
1 terror
1 think
1 Thomas
2 top
1 toys
1 Tracy
1 trait
1 tramp
1 trouble

1 useless

1 walk
1 water
1 whistle
1 whistles
1 wicked
2 wild
1 wildness
2 woman
1 woods
1 work
1 working

22 young
1 youngster
83 youth
1 youthful

58. LIGHT

1 agreeable
8 air
1 airy
1 arc
1 assistance
1 awake

1 beacon
2 beautiful
1 beautifying
1 beauty
1 biscuit
3 black
2 blue
1 bread
47 bright
21 brightness
3 brilliant
1 brown
2 burn
1 burning

3 candle
1 cheer
2 clear
2 clearnr
2 coat
19 color
2 comfort
1 complexion
1 convenient
1 cork

231 dark
93 darkness
2 dawn
81 day
2 daylight
6 daytime
1 dimness
1 distance
1 dress
1 dull

2 early
1 easy
1 education
7 electric
8 electricity
1 element
1 emptiness
1 enjoy
1 evening
1 eyes

1 fair
6 feather
1 feathers
6 fire
1 flame
1 fleshy
1 forward
1 fuel

21 gas

1 glare
1 gleam
8 good

2 hair
4 happiness
1 health
1 healthy
1 hearted
8 heat
1 heaven
5 heavy
1 hills

1 illuminate
7 illuminat'

1 joy

1 kerosene
1 knowledge

1 laboratory
82 lamp
1 lamps
7 life
1 long
1 look
1 luminous

1 match
10 moon

7 morning

1 nice
8 night
1 necessity

1 paper
1 pathway
1 peaceful
1 pink
1 pipe
1 placid
3 pleasant
1 pleasure
1 plenty

2 rays
1 red
1 reflection
1 right
3 room

24 see
3 seeing
1 seen
8 shade
2 shadow
1 shadows
2 shine
2 shines
2 shining
8 sight

1 sign
8 sky
1 soft
1 sound
1 space
1 splendor
1 steam
85 sun
1 sunlight
11 sunshine
1 swift

1 transparent
1 truth
1 twilight

1 ventilation
1 Vera
1 vibration
2 vision
1 vivid
1 waist

2 warmth
1 waves
1 weak
2 weight
8 white
2 whiteness
15 window
1 world

6 yellow

59. HEALTH

1 action
2 activity
9 air
1 athletics

5 bad
1 baseball
1 beautiful
10 beauty
1 better
4 blessing
1 blood
1 board
9 body
1 boon
2 boy
1 broad
2 buoyancy

1 care
1 careful
1 cheer
1 circulation
1 cleanliness
1 climate
1 color
26 comfort
6 condition
1 constitution
1 consumption
1 contentment
1 convenience
2 country

8 desirable
9 disease
4 doctor

1 eating
6 enjoyment
2 everything
1 excellent
1 excursion
3 exercise
1 existence

1 face
2 feel
12 feeling
1 fine
4 food
1 form
2 fortune
1 freedom
1 fun

3 gift
1 girl
2 gladness
1 glow
1 golf
94 good
1 goodness
2 grand
1 gymnasium
1 gymnastics

111 happiness
7 happy
1 haste
1 healing
1 healthful
1 healthy
1 heaven
2 holiness
2 hygiene

3 ill
13 illness

6 joy

5 life
1 light
1 live
3 living
2 luck
1 luxury

4 man
1 me
3 medicine
1 merriment
1 mother
1 mountain
1 moving

1 necessary
1 needed
1 needful
4 normal

1 optimism

1 pain
8 perfect
6 person
3 physical
1 physician
1 physiology
1 play
2 pleasant
14 pleasure
1 plenty
2 poor
1 preserve
1 proper
4 prosper

1 quick

1 red
3 riches
9 robust
1 rose
3 rosy
1 round
2 rugged

1 self
9 sick
2 sickly
153 sickness
1 smiles

5 sound
1 spirit
1 spirits
1 state
112 strength
1 strengths
31 strong
1 sturdy
1 success

1 temper
2 thankful
1 trouble

1 unhealthiness
3 unhealthy
2 useful

1 valuable
11 vigor
1 virility

1 walking
2 want
1 warm
1 water
1 weakness
76 wealth
63 well
1 wholesome
1 woman
1 wonderful

1 youth

60. BIBLE

1 academy
1 all
1 ancient

1 beauty
1 belief
1 beneficial
2 black
333 book
1 books

1 catechism
8 Christ
3 Christian
60 church
3 class
1 clean
1 clergyman
2 comfort
2 command
1 commandment
2 commandments
1 creed

1 devotion
1 directions
1 drama
2 duty

1 encyclopedia
1 excellent

1 fable
1 faith
2 family

1 Genesis
1 glass
43 God
28 good
12 goodness
3 gospel
1 gospels
1 grand
1 guide

2 heaven
1 heavy
1 help
26 history
5 holiness
67 holy
2 home
1 hope
2 hymns

1 instructive

1 Jacob
4 Jesus
2 knowledge
1 Koran

4 large
3 law
1 leaf
1 leaves
1 lectern
1 legend
2 lie
3 life
2 light
2 literature
6 Lord
2 love

1 message
1 mine
3 minister
2 Moses
1 mother

1 necessary
1 noble

2 obey
1 open

1 paper
1 piety
2 pious
3 pray
2 praying
19 prayer
7 prayers
13 prayer-book
2 preacher
1 preaching
1 prophet
4 psalms

1 rarely
31 read
19 reading
1 reformation
89 religion
4 religious
1 reverence
1 righteous
3 rot

3 sacred
2 Saviour
2 school
17 scripture
3 scriptures
1 sermon
1 shelf

1 sour
1 stones
2 stories
4 story
1 strength
2 studies
6 study
6 Sunday

3 table
1 teach
1 teacher
1 teachings
24 Testament
4 text
1 tradition
2 true
17 truth
1 truthfulness

1 unnecessary
2 useful

1 verses

1 weariness
8 word
1 words
2 worship
1 writ

61. MEMORY

2 absent
1 acquire
1 aid
1 analysis
1 ancient
2 association
1 attention
1 attitude
1 aunt

1 back
19 bad
1 beautiful
1 bird
8 blank
2 book
3 books
46 brain
5 brains
1 brightness
1 bucket

1 catechism
1 cause
1 charming
4 childhood
1 clear
2 concentration
1 connection
1 conscience
2 consciousness

1 dancing
1 death
1 debts
2 defect
1 defective
1 desirable
1 deterioration
1 dictionary
1 dim
1 distant
1 dream
8 dreams
1 dull

1 easy
1 educated
1 effort
1 elusive
1 English
1 Europe
2 events
1 everything
2 excellent
1 experiment

1 faces
1 faculty
1 failing
1 fails
4 fair
1 fancy
1 far
1 farther
1 fascination
1 faulty
1 feeling
1 fine
1 fleeting
1 fond
1 fool
25 forget
5 forgetful
37 forgetfulness
5 forgetting
3 forgotten
1 forty
1 friends

2 gone
68 good
1 gravestone
1 great
2 green

1 happiness
1 happy
9 head
1 hearing
2 history
2 home
1 hopefulness

2 idea
1 image
2 imagination
1 impossible
1 increase
7 intellect
5 intelligence
1 interpret
1 invisible

1 joy

1 keep
1 know
4 knowledge

2 lack
2 lacking
1 language
1 lasting
1 learn
2 learning
1 lecture
1 length
2 lessons
1 light
3 long
1 loss
1 love

magnificent
3 man
1 marvelous
1 me
1 memorandum
1 memorizing
4 mental
138 mind
1 mindful
2 mnemonics
1 mother
1 mud
1 my
1 myself

1 names
3 necessary
1 necessity
1 needful
1 noble
1 none

1 oblivion

1 painful
8 past
1 patient
1 pen
2 perception
2 person
2 picture
1 pictures
1 pleasantness
2 pleasure
3 poem
1 poems
7 poetry
23 poor
1 power
1 psychology

1 quick

1 reading
1 reason
4 recall
2 recalling
3 recognition
2 recollect
16 recollection
3 recollections
1 reflect
27 remember
4 remembering
18 remembrance
2 remind
1 reminder
2 reminiscence
1 reminiscences
1 reproductive
1 result
1 retain
2 retaining
5 retention
3 retentive
1 retrospect

1 sadness
1 scenes
1 scholar
6 school
1 sensation
5 sense
2 senses
7 short
1 simple
1 song
2 sound
1 splendid
1 stanza
1 storehouse
1 story
1 strengthen
1 strong
1 student
4 study
1 studying
1 sure
7 sweet
1 swift
1 swing

1 teacher
1 tender
5 test
1 thankful
1 things
63 think
23 thinking
1 thinks
81 thought
28 thoughts
8 thoughtful
8 thoughtfulness
1 thoughtlessness
1 time
1 train
1 training
1 tree

1 unconsciousness
8 understand
6 understanding
1 unstable
2 useful

2 verses

1 weak
1 well
1 will
1 wit
1 wonderful
2 work

2 youth

62. SHEEP

225 animal
18 animals
1 astray
1 awkward

1 baa
3 beast
1 bed
1 Bethlehem
5 black
1 blind
1 buffalo

1 calf
1 calm
47 cattle
1 cloth
8 country
22 cow
5 cows

1 death
2 deer
2 dirty
6 dog
2 dogs
1 eat

4 farm
1 feed
12 field
6 fields
3 fleece
1 flesh
24 flock
1 flocks
4 fold
1 follow
2 food
1 foolish
1 fowl
1 fur

1 gentle
1 gentleness
1 goad
17 goat
10 goats
2 good
4 grass
1 graze
5 grazing
1 group

1 hair
1 harmless
4 herd
1 herder
1 hill
2 hillside
1 horn
1 horse
1 humanity

5 innocence
2 innocent

1 jump

151 lamb
36 lambs
1 landscape
2 large
1 lecture
1 lowing

1 many
3 meadows
5 meat
1 meekness
3 mountain
60 mutton

1 nature

1 oxen

2 park
27 pasture
8 pastures
1 peace
1 peaceful
1 pet
1 picture
2 pig
1 plains
1 play
4 pretty

2 quadruped

1 raising
1 ram
1 rocks
1 run
1 running

1 shear
1 shearing
1 shears
15 shepherd
1 simple
1 sleep
2 small
1 soft
1 spring
2 stock
1 stupid

1 tick
1 trust

1 wander
1 water
18 white
2 wolf
143 wool
10 woolly

63. BATH

1 baby
1 basin
2 bathe
6 bathing
1 beneficial
1 boat
1 boy

120 clean
1 cleaning
109 cleanliness
2 cleanly
9 cleanness
6 cleanse
8 cleansing
14 cold
3 comfort
3 cool
1 Creal Springs

1 delight
4 dirt
5 dirty

1 dry

1 English
1 every

1 filth
1 filthiness
1 fine
1 flowers
1 fluid
2 fresh

7 good

9 health
1 healthful
1 healthiness
4 healthy
10 hot
4 house

1 invigorates
2 invigorating

1 joy

1 large
1 luxury

1 man
1 massage
2 morning

1 nakedness
1 neatness
5 necessary
2 nice
1 none

6 ocean
1 often
1 once

3 pleasant
2 pleasure
2 plenty
3 plunge
1 porcelain

1 refreshed
6 refreshing
1 refreshment
2 river
3 robe
6 room

1 salt
1 sanitary
1 scrub
1 sensation
3 shower
1 sleeping
13 soap
1 soothing
1 sponge
4 spray
1 springs
10 swim
5 swimming

1 take
1 taken
2 toilet
6 towel
2 towels
71 tub

1 vapor
1 vessel

1 want
3 warm
102 wash
16 washing
339 water
5 wet
1 wood

2 yesterday

64. COTTAGE

2 abode
1 agreeable
1 alone
1 apartments

2 barn
1 beach
1 beautiful
1 box
3 brick
1 brook
2 brown
31 building
13 bungalow

3 cabin
1 camp
2 camping
1 Cape Cod
2 castle
1 chair
1 cheese
3 city
15 comfort
2 contentment
1 cottage
36 country
2 couple
2 cozy
1 cute

1 distant
2 door
23 dwelling

2 family
1 far
4 farm
1 fence
6 field
2 fine
4 flowers
2 frame

7 garden
3 green

1 habitable
3 habitation
1 hamlet
1 hammock
1 handsome
5 happiness
1 happy
3 hill
85 home
1 homelike
1 homestead
1 hope
1 hospital
461 house
1 houses

1 innocence
1 ivy

5 lake
1 lane
1 large
4 lawn
4 little
17 live
5 living
1 log
1 lonesomeness
4 love
2 low
1 lumber

1 Maine
15 mansion

1 name
3 neat
1 Newburgh
4 nice

2 one
1 open
1 orchard
1 outing

1 painted
2 palace
2 parsonage
1 patient
1 patients
1 peace
1 people
1 picturesque
1 place
1 pleasantness
1 pleasure
1 pond
4 porch
1 prettiness
3 pretty
1 pudding

1 reside
4 residence
1 resident
1 resort
3 rest
1 river
1 rod
3 roof
1 roomy
2 roses
1 rustic

1 school
10 sea
5 seashore
2 seaside
6 shelter
2 shingles
2 shore
1 simplicity
1 sleep
30 small
1 snug
1 stands
3 structure
9 summer
1 sweet
1 Switzerland

1 table
4 tent
2 thatched
1 tower
1 trees
3 two

1 unity

2 vacation
1 veranda
1 villa
3 village
1 vine
3 vines

3 white
2 window
1 woman
11 wood
1 wooden
3 woods

1 yard

65. SWIFT

2 active
2 aeroplane
1 ahead
1 antelope
13 arrow
11 automobile
1 autos

6 ball
1 beauty
1 better
1 bicycle
16 bird
1 birds
1 boat
1 brisk
1 brook
3 bullet

1 cat
1 channel
1 child
1 choice
1 clever
1 creek
7 current
1 curve
1 cutting

7 deer
1 degree
1 doctor
2 dog

8 eagle
2 easy
3 engine

222 fast
1 fastness
1 fear
1 fish
5 fleet
6 flight
8 fly
3 flying
1 foot

1 girl
1 go
1 going
1 good
1 grand
1 Greek

1 herd
1 hare
1 haste

1 hear
1 high
28 horse
12 hurry
1 hurrying

1 Indian

1 kite

1 launch
1 lazy
2 light
4 lightning
3 lively

1 man
1 Marathon
1 Mercury
1 messenger
1 meteor
1 more
1 morning
2 motion
1 motoring
2 movement
1 moving
1 muscles

1 near
1 Niagara Falls

1 power

117 quick
13 quickly
5 quickness
1 quiet

6 race
27 rapid
2 rapidity
2 rapidly
1 real
1 riding
18 river
1 rivers
1 road
1 rocket
19 run
20 running
13 runner
1 rushing

1 sail
1 sharp
1 shot
1 sleigh
190 slow

4 slowly
16 smart
1 smartness
3 smooth
29 speed
1 speedily
1 speeding
7 speedy
1 spinchiled
2 spry
1 steam
1 sting
1 stone
8 stream
2 strong
2 sure
5 swallow
1 swallows

1 throw
2 tide
1 time
18 train
1 trains

1 walking
11 water
8 wind
1 work

66. BLUE

1 air
1 azure

1 ball
1 beautiful
1 becoming
1 bell
1 binding
5 bird
88 black
1 blood
1 blossom
1 blotter
1 bluebird
2 bluing
1 blusey
1 book
5 bright
8 brown

1 cadet
1 chemical
1 clock
7 cloth
3 clothes
1 clothing
1 cloud

1 cold
256 color
2 colors
2 coloring

1 dainty
24 dark
5 deep
1 depth
18 dress
1 dull

1 ether
6 eyes

1 fair
4 feeling
1 fidelity
6 flag
3 flower
1 forget-me-not

1 gentian
1 globe
2 gloominess
2 gloomy
1 glum

1 good
2 grass
10 gray
54 green

1 hat
5 heaven
2 heavens
1 heavenly
1 homesick
1 hopeful
1 horizon
1 house
1 hue

5 indigo
6 ink

1 lake
8 light
1 lily
1 lonesome

2 melancholy
1 Monday

1 navy

1 necktie

12 ocean

8 paint
1 pale
1 paper
1 pencil
9 pink
2 pleasant
1 pleasing
1 policeman
4 pretty
1 purity
2 purple

54 red
1 restful
3 ribbon
1 river
1 room

2 sad
1 sailor
7 sea
1 serge
2 shade

1 skies
239 sky
1 soft
1 somber
1 space
1 stripes
1 suit

2 tie
1 tint
7 true
2 truth
1 turquoise

1 unhappy
1 unrest

1 velvet
2 violet
3 violets

2 washing
8 water
47 white
2 wind

2 Yale
27 yellow

67. HUNGRY

1 aching
1 ambitious
1 angry
2 animal
1 appeasing
57 appetite

2 appetizing

2 baby
8 bad
1 bananas
1 bear

4 beggar
1 biscuit
5 boy
26 bread
3 breakfast
1 butcher

1 candy
5 child
5 children
4 cold
1 college
1 country

1 crackers
1 crave
7 craving
1 cupboard

1 dark

1 desirable
11 desire
1 devil
1 devour
81 dinner
1 disagreeable
4 discomfort
1 displeasure
1 dissatisfaction
1 dissatisfied
1 distress
14 dog
1 dogs
1 dry

126 eat
64 eating
2 eatables
1 emotion
4 emptiness
13 empty
2 exhausted

9 faint
1 fainting
5 famine
1 famish
11 famished
1 famishing
1 fascinating
3 fast
5 fasting

4 fatigue
1 fatigued
4 fed
1 feel
8 feeling
1 fill
4 filled
130 food
1 form
1 fulfilment
9 full
3 fruit

1 gaunt
1 Gertrude
1 girl
2 gnawing
1 good
1 grub

1 hardship
1 Henrietta
1 hog
1 horse
2 hunger

3 I
1 ice-cream

1 kitchen

2 lack

1 lion
5 longing
4 lunch

5 man
4 me
1 meal
3 meat
1 milk
2 miserable
1 misery

1 nausea
1 necessary
2 need
1 needy
1 never
1 nice
1 no
1 noon
1 nothing
1 nourish
2 now

1 ocean
1 often

5 pain
1 painful
1 pallid
1 pang
1 peaches

1 perishing
2 person
2 picnic
2 pie
2 plenty
1 plow
6 poor
1 potatoes
2 poverty
1 present

1 ravenous
1 repletion

1 sad
2 sandwiches
3 satiated
2 satiety
14 satisfied
2 satisfy
1 school
1 sensation
1 sharp
1 ship
1 sick
1 sleepy
1 slow
2 sorrow
10 starvation
8 starve
15 starved
29 starving

2 steak
13 stomach
1 suffering
1 sufficiency
1 sufficient
2 supper

1 table
12 thirst
61 thirsty
1 thought
1 tiger
12 tired
1 tiresome
3 tramp
1 traveling

1 uncomfortable
1 unhappiness
4 unhappy
4 unpleasant
3 unsatisfied

1 very
1 viands
1 victuals

1 walk
25 want
5 wanting
5 weak
3 weakness
2 wish
10 wolf

68. PRIEST

3 altar
1 authority

1 belief
3 Bible
6 bishop
13 black
1 blessing
1 book
1 boy
1 brother

1 cassock
2 cathedral
36 Catholic
2 Catholics
4 Catholicism
1 ceremony
1 chancel
2 chapel
1 childhood
166 church
1 clean
80 clergy
62 clergyman
1 cleric
2 clerical
1 cloister
1 cloth
1 clothes
1 collar
1 comforter
1 command
1 communion
5 confession
2 confessor

1 conscientious
1 console
1 counsellor
1 crucifix

1 dignified
2 discipline
1 discontent
1 dishonor
1 dislike
1 divine
1 divinity
5 doctor
1 doing
1 dominie
1 dress
1 Dr. K.
1 duty

1 exalted

2 faithful
2 fakir
1 fakirs
3 fat
15 father
1 follower
1 forgive
1 forgiveness

2 garb
1 gentleman
2 God
9 good
1 goodness
6 gown

2 heaven
1 high
3 holiness
15 holy
2 honor
2 hood
1 house
1 humble
2 hypocrite

1 inspired
1 instruction

2 Jew
1 just
1 justice

1 kind
1 knowledge

2 layman
4 leader
1 lecture
1 Levi
2 Levite
1 Lord

5 male
75 man
5 mass
178 minister
5 monastery
9 monk
1 moral

1 noble

12 nun

1 office

11 parson
11 pastor
1 people
3 person
1 piety
4 pious
3 Pope
1 power
1 praise
3 pray
1 prays
8 prayer
1 prayers
3 preach
2 preaches
35 preacher
2 prelate
2 priestess
1 profession
3 prophet
1 pulpit
2 purity

2 rabbi
57 religion
7 religious
1 representative
1 repulsive
1 reserved
1 reverend
2 righteous
1 road
12 robe

8 robes
1 ruler

2 sacred
1 sacrifice
1 sanctity
1 school
1 sent
1 serious
3 sermon
1 sermony
2 servant
2 service
1 services
2 shaven
1 shoot
1 sinner
1 sister
1 slim
1 solemnity
1 sometimes
1 spookism
1 stern
1 student
2 Sunday
3 surplice

1 table
2 teacher

1 ugly

1 vest
1 vicar

1 York

69. OCEAN

1 afraid
1 angry
11 Atlantic

1 barge
3 bathing
3 bay
5 beach
1 beautiful
5 big
1 bigness
1 billows
25 blue
6 boat
1 boats
2 body
1 boisterous
3 breadth
1 breeze
3 broad
1 Byron

1 Cape Cod
2 Coney Island
1 country

1 crossing
1 current

1 dark
87 deep
1 deepness
10 depth
1 depths
2 distance

1 enormous
1 Europe
2 expanse
1 expansive

1 float
2 foam

2 grand
2 grandeur
3 great
1 greatness
2 green
2 Grove
1 gulfs

1 Hudson

1 immense
2 immensity
2 infinity

2 joy

12 lake
8 land
9 large
1 launch
1 liquid

1 Maine
1 Mauretania
1 might
3 mighty
2 motion

1 power
1 pretty

1 quantity

36 river
1 roars

12 rough

2 sail
2 sailing
10 salt
2 sand
1 Sandy Hook
75 sea
3 seas
2 seashore
1 seething
1 shining
24 ship
11 ships
2 shore
1 sky
1 sound
1 storm
1 storms
1 steamboat
14 steamer
1 steamers
1 steamship
4 stream
1 swiftness

2 swim
1 swimming

1 tide
1 terrible
1 traveling
1 trip

1 valley
7 vast
9 vastness
2 vessel
1 voyage

1 waste
427 water
1 waters
12 wave
45 waves
1 wavy
2 wet
1 white
15 wide
1 wonder
1 wonderful

70. HEAD

1 above
9 ache
1 aches
8 anatomy
2 animal
1 appearance
2 arm
3 arms
1 asymmetrical

1 baby's
2 back
1 bald
1 ball
1 beautiful
1 beginning
6 big
1 black
146 body
1 bonehead
1 boss
58 brain
32 brains
1 branch
1 bright
1 brown

7 cabbage
3 captain
1 cattle
2 cavity
2 chest
2 chief
1 chop
1 clear
2 comb

1 combs
1 consciousness
1 cover
1 covered
2 cow
11 cranium
1 crown

1 director
1 donkey

1 ear
1 ears
1 emptiness
1 empty
1 encephalon
1 end
1 extremity
2 eye
10 eyes

13 face
1 father
1 feature
2 features
26 feet
1 figure
1 firm
2 first
1 food
64 foot
1 forehead
1 front

1 girl
1 glasses

3 good
1 govern
1 great

159 hair
11 hand
2 hands
1 handsome
2 hard
17 hat
1 headless
8 heart
2 heels
3 high
2 highest
2 hot
1 house
4 human

1 individual
2 intellect
3 intelligence

1 king
1 knee
17 knowledge

19 large
1 leadership
1 leading
1 life
2 light
3 limb
1 limbs
1 little
1 long
1 louse

14 man
1 man's
1 masterpiece
1 medium
7 member
3 memory
1 mentality
14 mind
1 mouth

1 nail
1 nation
17 neck
2 nose

5 organ

1 pain
6 part
1 people
15 person
2 physiology
1 planning
1 Pope
3 power
2 president
1 pretty
2 principal
1 procession

1 quarters

2 rest
21 round
1 roundness
3 ruler

4 scalp
3 sense
1 senses
1 sensible
4 shape
1 shaped
1 shoulder
12 shoulders
5 skull
7 small
2 sore
1 square
2 statue
2 stomach
1 strong
2 superintendent
1 symmetry

3 tail
1 teeth
2 thick
9 think
6 thinking
16 thought
4 thoughts
1 tired
31 top
2 trunk

2 useful

1 whirl
1 wit
1 woman
2 woman's
1 work

71. STOVE

8 article

1 bake
1 baking
69 black
4 blacking
1 box
1 breakfast
2 bright
12 burn
2 burning

1 chair
1 chimney
25 coal
2 comfort
24 cook
84 cooking
1 cooks
8 cover

1 dark

1 dinner
1 dirt
1 dishes

217 fire
3 fireplace
1 flame
3 food
1 Franklin
1 fry
1 fuel
6 furnace
8 furniture
1 furnitureness

7 gas
1 German
2 good
1 grate

2 hard
1 hardware

213 heat
1 heating
1 heats
5 heater
2 heavy
1 home
86 hot
2 house
1 household

1 icebox
1 implement
2 instrument
61 iron
1 isinglass

4 kettle
11 kitchen

3 lamp
2 large
2 legs

4 lid
3 lifter
1 light
1 long

2 metal

1 oil
1 oven

1 painful
18 pipe
1 pipes
5 poker
10 polish

2 radiator
19 range
1 receptacle
1 red
2 room

1 round
1 rusty

1 shovel
1 sink
2 small
1 smoke
3 steel
1 structure

1 teakettle

1 using
2 utensil

32 warm
42 warmth
1 water
2 winter
7 wood

1 zinc

72. LONG

1 age
1 anxiety
1 arm
1 arms
2 avenue
1 away

1 barn
1 beach
1 bench
1 big
1 blackboard
2 board
6 boat
1 book
1 boulevard
1 bridge
2 broad
1 Brooklyn Bridge
1 broomstick
1 building

1 cable
1 chimney
1 coat
1 courage
1 craving

9 day
1 days
1 deep
1 depth
1 desirable
1 dimensions
81 distance
8 distant
6 dress
1 duration

1 elongated
1 endless
1 enough
2 eternity
1 extended
1 extension
1 extensive
1 extent

8 far
1 feet
1 fellow
2 fence
1 flagpole
1 foot
1 for

2 giant
1 girl
2 glass
4 grass
1 great

2 hair
2 hall
1 head
1 height
6 high
1 hill
1 hose
1 hours
1 house

2 Island

8 journey

1 labor
8 lane
2 lanky

7 large
1 lasting
1 lecture
1 legs
60 length
6 lengthy
1 level
4 life
5 line
1 linear
1 live
1 Lusitania

5 man
7 measure
2 medium
1 meter
13 mile
1 miles
1 Mississippi
1 much

1 name
15 narrow
2 night
1 nose

1 oblong

2 path
1 person
1 pin
1 pipe
1 plant
1 plenty
20 pole

4 railroad
1 railway
1 rails

1 reed
3 ribbon
1 ride
15 river
32 road
1 rod
1 room
7 rope
1 row
1 rug
2 rule
4 ruler

1 shape
1 sharp
1 shore
413 short
1 shovel
1 slender
1 slim
1 slow
1 small
2 snake
1 something
1 space
1 spacious
1 spire
1 square
1 stay
1 steamer
1 steeple
8 stick
1 sticks
2 story
1 straight
6 street
1 streets
1 strength
2 stretch
6 string

1 stupid
1 summer

3 table
26 tall
1 test
2 thin
2 thread
1 throw
15 time
1 tiresome
1 tower
3 track
2 train
4 tree
1 trip

1 vast
1 very

1 wait
2 waiting
7 walk
1 walking
1 walls
6 way
1 ways
1 weary
1 whale
1 while
7 wide
1 winter
1 wire
1 wishing
1 without
1 worm

4 yard
2 year

73. RELIGION

1 Abraham
1 aesthetics
1 aim
1 all
1 anything
1 association
2 atheism
4 atheist

2 Baptist
1 beauty
89 belief
1 beliefs
2 believe
1 believing
1 believer
1 belong
1 belonging
52 Bible
1 body
2 books
8 brain
1 Buddha

1 catechism
56 Catholic
2 ceremony
1 China
8 Christ
14 Christian
7 Christianity
1 Christlike
161 church
4 churches
1 churchman
1 civilize
1 clergyman
4 comfort
1 commandments
1 conduct
1 Congregational
2 conscience
1 conversion
2 Creator
83 creed
1 custom

1 deep
11 denomination
4 devotion
2 different
1 difficult
1 dislike
1 divine
4 doctrine
1 dogma
2 doubt
1 Druids
1 duties
2 duty

1 emotion
4 Episcopal
1 Episcopalian
1 eternity
2 ethics
1 everyday

1 fair
47 faith
1 fake
2 fanatic
1 fanaticism
1 feeling
1 fine
2 foolish
1 free

1 gentile
1 German
81 God
1 godly
46 good
10 goodness
2 gospel
1 government
8 guide

8 happiness
1 harmony
1 health
8 heathen
8 heaven
1 Hebrew
2 helpful
1 hereafter
1 heresy
2 history
4 holiness
10 holy
1 honor
1 house
1 hypocrisy

2 idea
1 ideas
1 ignorance
1 indefinite
1 indiscreet
1 institutions
1 irreligion
1 irreligious

8 Jesus
3 Jew
1 Jews
4 Jewish
1 just

2 kind
1 knowledge

1 law
1 learning
4 life
1 living
1 Lord
1 Lutheran

1 man
1 men
1 mankind
1 many
1 mental
1 Methodism
7 Methodist
15 minister
1 modesty
2 Mohammed
2 morals
1 mystic

2 nationality
1 need
1 no
5 none
2 nothing
1 nun
1 nuns
1 obey
8 opinion
1 order
1 orthodox

1 paganism
8 peace
8 people
1 perfect
1 persecution
2 person
8 persuasion
13 piety
13 pious
2 poor
1 Pope
1 powerful
2 practice
2 pray
2 praying
21 prayer
5 prayers
2 prayer-book
2 preacher
2 preaching
8 Presbyterian
28 priest
3 profession
1 professor
30 Protestant
1 pulpit
2 pure
1 puzzle

1 question

1 race
1 rector
2 religious
8 reverence
2 right
2 righteousness

1 sacrament
4 sacred
1 sacredness
1 saintly
1 saints
2 salvation
1 scholastic
2 science
1 scriptura
8 sect
2 sectarian
1 self
8 service
1 sheeney
1 society
1 solace
1 somewhat
1 soul
1 spirituality
1 stability
1 standby
1 study
1 superstition

1 tabernacle
1 table
1 teaching
1 temperament
2 temple
2 think
1 thinking
12 thought
1 thoughtful
1 training
1 true
1 trust
6 truth

1 uncertain
1 uncertainty
1 unknowable

1 virtuous
1 vow

1 want
1 wickedness
1 wide
1 woman
1 wonder
1 wonderful
1 work
14 worship
1 worshipping

1 Yankee

74. WHISKEY

1 abomination
50 alcohol
1 ale
1 amber
1 appetizer
1 apple
1 awful

85 bad
1 barley
2 barrel
1 bed
46 beer
9 beverage
1 biting
6 bitter
10 booze
1 Boston
29 bottle
24 brandy
1 breath
1 burn
4 burning

1 Carrie Nation
8 cider
1 closet
1 color
1 corn
4 curse

1 dangerous
1 dark
1 death
1 degradation
1 despised
1 destruction
1 devil
1 deviltry
1 Dewar's
1 disagreeable
1 discontent
1 disgust
1 distillery
1 distress
1 dope
1 dreadful
232 drink
1 drinks
17 drinking
1 drinkable
1 drug
81 drunk
18 drunkard
8 drunkards
26 drunkenness
2 evil

1 fast
4 fire
1 flask
4 fluid
1 food
1 full

8 gin
8 glass
15 good
1 grain

1 hard
1 headache
1 Hennessey's
1 hops
1 horror
8 hot
1 hotels
1 Hunter

1 indulge
1 indulgence
1 inebriety
1 insanity
5 intemperance
13 intoxicant
2 intoxicants
8 intoxicated
14 intoxicating
14 intoxication

1 jag

1 Kentucky
1 knock

1 law
12 liquid
1 liquids
70 liquor

2 malt
2 man
4 medicine
1 misery
1 money
1 moonshine

3 narcotic
2 nice
1 none

1 odor
1 old

1 pint
1 place
1 pleasant
4 poison
1 poor
1 poorhouse
1 powerful
2 prohibition
1 punch

1 rarely
2 red

1 ruin
1 ruination
23 rum
9 rye

15 saloon
1 saloons
1 Scotch
1 seasickness
2 sick
2 sickness
2 smell
1 smuggle
1 sorrow
4 sour

5 spirit
23 spirits
38 stimulant
4 stimulants
1 stimulating
1 stimulation
1 stomach
2 straight
6 strong
1 stupidity
1 suffering

1 taste
4 temperance
1 temptation

1 terrible
1 thirst
1 thirsty
1 tipsy
1 toddy
1 toper
2 trouble

1 unhealthy
1 unpleasantness

1 warm
9 water
16 wine
1 wrong

75. CHILD

5 adult
3 angel

7 babe
193 baby
1 bad
8 beautiful
5 beauty
8 being
2 birth
2 blessing
2 body
1 born
64 boy
8 boys
1 burden

1 care
1 carriage
1 charm
1 childhood
1 childish
1 Christ
1 clothes
8 comfort
1 coming
1 companion
2 cradle
1 creep
1 crib
1 cries
4 cry
1 cross
1 cunning
3 cute

1 darling
2 daughter
1 dear
1 dearest
1 delight
1 disobedient
1 dog
4 doll
4 dress
1 dresses

1 Eleanor
1 Elizabeth
1 embryonic
1 expectation

2 family
1 fat
5 father
3 female
1 frolicsome
2 fun
1 fussy
1 future

45 girl
2 girls
1 glass
7 good
1 goose
1 Greta
1 growing
1 growth

1 habits

1 hair
2 happiness
2 happy
1 healthy
1 helpless
1 helplessness
6 home
2 hood
1 hospital
5 human
1 humanity

1 ill
1 immature
1 infancy
122 infant
1 injury
16 innocence
11 innocent
1 instinct
2 interesting

1 joy
2 juvenile

4 kid
1 kindergarten

2 labor
2 lady
2 large
1 like
11 little
1 lonely
1 lovable

8 love
2 loving
4 lovely

1 male
1 mammal
41 man
1 maternity
1 me
1 mite
55 mother
1 motherhood

1 naive
1 naughty
1 necessary
1 nephew
1 nice
1 night-dress
1 noise
2 nuisance

1 obedient
6 offspring

6 parent
1 parents
3 people
18 person
1 pet
14 play
3 playing
3 playful
4 pleasure
1 plump

1 precocious
10 pretty
1 pupil
1 pure
1 purity

1 rattle
1 religious

5 school
1 screaming
1 senses
1 simple
1 simplicity
1 sister
52 small
1 smile
2 son
1 spoiled
1 study
6 sweet
2 sweetness

1 table
1 tender
1 three
1 toys
1 trouble

3 weak
18 woman

30 young
2 youngster
29 youth
1 youthful

76. BITTER

8 acid
1 acrid
1 agreeable
1 ale
4 almond
3 almonds
4 aloe
6 aloes
1 altogether
2 alum
3 anger
3 apple
1 apples
1 apricot
1 astringent

10 bad
1 banana

5 beer
1 berry
1 biting
1 boneset
1 burdock

1 candy
1 cascara
1 chastisement
1 chickory
1 chocolate
1 cider
6 cold
1 cross
1 cup

1 deep
10 disagreeable

1 disappointment
2 dislike
10 distasteful
1 dregs
2 drink

2 enemy

1 feelings
1 flag
4 fruit

42 gall
2 good
1 grape
3 grapefruit
1 grasa
2 grief

1 grudge

2 hatred
2 herb
5 herbs
1 hops
3 horrid
1 horseradish

1 icy
1 ill
1 irritating

8 lemon
1 lemons
1 lemonade
1 lessons
1 life

1 limes
1 liquor
1 love

1 magen
1 man
1 mandrake
37 medicine
1 Mirabar
1 morphine

3 nasty
1 nice
1 none
1 nux

1 offensive
1 olives
3 orange

1 peach
1 peel
9 pepper
2 persimmon
8 pickle
1 pickles
1 pleasant
4 plums
1 poison
3 pucker
1 puckering

1 quassia
1 quince
23 quinine

1 rank

1 sadness
2 salt
2 salts
3 sharp
8 sorrow
1 sound
222 sour
2 sourness
1 spice
3 strong
1 strychnia
4 strychnine
1 suffering
305 sweet
1 sweeter

8 tart
66 taste
3 tasteless
1 tasting
1 tea
1 tears
1 temper
3 thoroughwort
1 thought
1 tonic
2 tonics
1 trouble
1 turnip

3 ugly
1 unhealthy
1 unpalatable
19 unpleasant
1 unpleasantness
1 unsweetened
1 unwholesome

1 vegetables
17 vinegar

1 water
1 weather
1 wine
1 word
2 words
2 wormwood
1 wrong

77. HAMMER

2 action
1 annoyance
6 anvil
1 article
1 awl
11 axe

8 bang
1 beating
2 blacksmith
6 blow
2 board
1 bruiser
2 building

13 carpenter
1 carpentering
10 chisel
1 claps
1 claw
2 club
1 concussion
1 convenience

17 drive
1 drives
5 driving
1 door

1 easy
1 effort

8 finger
2 force

1 geology

5 handle
63 hard
6 hatchet
2 head
13 heavy
21 hit
1 horseshoe
1 hurt
1 hurts

8 implement
38 instrument
45 iron

2 J.
1 knife
35 knock
5 knocker
5 knocking

2 large
1 lost

8 mallet
1 mark
1 maul
1 metal

185 nail
98 nails
2 nailing
86 noise
1 nut
1 nuts

2 one

1 pain
2 picture
1 pictures
1 plumber
51 pound
12 pounding
1 pounds

1 rap
1 repairs
1 revolver
1 road
1 rod
1 round

9 saw
1 scissors
1 shoemaker
1 shop
10 sledge
2 small
9 sound
1 spade
1 stay
20 steel
1 stone
1 strength
28 strike
4 striking
1 stroke

8 tack
11 tacks
1 Thor
1 thread
6 throw
1 throwing
1 thumb
1 thump
1 toe
29 tongs
69 tool
3 tools
1 turf

1 use
5 useful
1 utensil

3 weapon
3 weight
6 wood
8 work
2 working

78. THIRSTY

1 all
2 always
1 animal
3 appetite

1 bar
4 beer
1 beverage
1 bird
1 boy
1 brooks

1 cattle
2 child
1 cold
4 craving
1 cream
2 cup

2 desert
4 desire
1 desiring
1 dipper
1 disagreeable
2 discomfort
2 dog
206 drink
23 drinking
8 drought
218 dry
5 dryness

1 emotion
1 empty
1 exhausted

1 famished
1 fatigue
5 feeling
1 fluid
1 food
1 fountain
1 glass
1 good

1 hard
1 haste
2 heat
1 horse
2 hot
9 hunger
41 hungry

1 labor
2 lack
1 lawn
7 lemonade
1 liquid
4 longing

1 man
2 mouth
1 nauseated

1 oranges

2 pain
3 parched
2 parching
1 people
1 person

12 quench
4 quenched

1 refreshing

1 satiated
3 satisfied
1 sensation
2 soda
8 spring
1 stream
1 suffering

1 terrible
1 throat
1 tongue

1 uncomfortable
2 unpleasant

1 very
1 vichy

2 walk
9 want
2 wanting
1 warm
341 water
1 wench
3 wet
2 work

79. CITY

1 Albany

1 beautiful
0 big
5 Boston
1 bridges
8 Brooklyn
6 building
20 buildings
1 bulk
1 Burlington
1 business
4 busy
2 bustle

6 capital
3 cars
1 charming
4 Chicago
1 child
7 citizen
1 civilization
1 Cleveland
2 collection
5 community
1 complexity
1 confusion
1 congregation
2 corporation
74 country

1 Creal
1 Creal Springs
11 crowd
7 crowded
1 crowds

1 density
1 dirt
1 distance

1 earth
1 excitement

1 fine
1 fun

1 gaiety
1 good
1 government
1 governor
2 great
1 greatness

8 habitation
1 heat
2 hill
5 home
1 homes
1 hot

3 house
52 houses

1 immense
1 incorporated
1 incorporation
2 industry
1 inhabitant
12 inhabitants
1 inhabited

1 joy

2 land
62 large
1 largeness
2 life
7 live
1 loathing
2 location
1 lots

1 machinery
1 majority
1 Manhattan
2 manufacture
3 many
2 men
6 metropolis

1 mill
1 mountain
1 municipal
1 municipality

1 nation
99 New York
12 noise
6 noisy

1 park
1 pavement
48 people
37 place
1 pleasantness
2 populated
19 population
1 populous
6 Poughkeepsie

2 republic
2 residence
1 resting
1 rich
1 scene
1 sea
1 settlement
1 shopping
1 shops

1 sights
1 sin
1 size
1 slums
1 small
1 smoke
2 space
1 Springfield
26 state
1 stores
3 street
11 streets

1 tale
1 ten thousand
2 theatre
1 theatres
2 towers
258 town
1 towns
1 township
1 traffic
1 traveling
1 tumult
2 turmoil

44 village

1 wagons
1 welcome
1 world

80. SQUARE

1 accurate
1 acre
1 across
1 active
1 airy
11 angle
6 angles
4 angular
1 arithmetic
1 association

1 bed
1 best
1 big
71 block
4 board
4 book
86 box
2 brick
5 broad
2 building
1 business

9 carpenter
1 carpet
1 cars
2 center
1 Chatham
1 checkers
22 circle
1 circular
4 city
1 Common
1 Commons
5 compass
1 concert
1 Copley
7 corner
18 corners
2 cornered
1 correct
1 correctness
1 cover

1 crackers
8 crooked
1 crowd
9 cube
1 cubic
1 cubical
1 curse
1 curve

1 deal
1 dealing
1 decoration
2 desk
1 Dewey
4 dice
1 die
2 door
1 Düsseldorf

1 earth
1 ease
6 equal
19 even
1 evenness
1 exact

3 fair
4 field
4 figure
1 file
4 flat
1 floor
2 foot
1 form
10 four
1 frame
1 furlong

5 garden
10 geometry
1 Getty
1 goods
1 grass

3 green
1 grounds

1 hand
2 handkerchief
1 Harlem
2 Herald
1 heavy
3 honest
1 honesty
5 house
3 houses

2 inch
1 inches
1 instrument
1 iron

1 just
2 justice
1 junction

1 kindergarten
1 knob

2 land
5 large
1 Lawrence
2 length
10 level
2 lines
1 little
18 long
1 lot

12 Madison
5 man
1 mark
1 marks
1 masonry
2 mathematics
1 meal
5 measure
2 measurement

1 measurements
1 metal
2 mile
1 monument

1 New York

2 object
82 oblong
1 obtuse
1 open
5 oval

5 paper
1 parallel
1 parallelogram
14 park
1 pavements
2 people
2 perfect
1 picture
2 pillow
4 place
1 plane
1 plot
1 proportion
2 public

1 quadrangle

15 rectangle
3 rectangular
1 rhomboid
5 right
1 Rittenhouse
1 road
5 room
250 round
9 rule
3 ruler

1 saddle
1 seat
6 shape

2 sharp
1 side
6 sides
1 sidewalk
1 size
1 sizing
6 small
1 smooth
2 solid
1 space
2 stand
1 steel
7 straight
9 street
1 streets
1 sugar
1 surface
1 surveyor

47 table
1 thoroughfare
3 Times
13 tool
1 tree
4 trees
11 triangle
1 true

1 uneven
1 uniform
4 Union
2 upright

8 village

1 walk
1 walks
1 wall
4 Washington
2 wide
1 window
5 wood

2 yard

81. BUTTER

2 bad
2 bill
2 biscuit
206 bread
1 breakfast
1 butter
1 butterine

41 cheese
4 churn
1 color
1 composition
1 cooking
1 cottolene
1 country
1 cup
29 cow
11 cows
34 cream

4 dairy
1 dairying
2 diet
2 dinner
5 dish
1 dripping

34 eat
12 eatable
2 eatables
6 eating
1 edible
2 egg
11 eggs
1 emollient
1 excellent

1 farm
1 farmer
21 fat
1 fatty
1 fish
1 flour
7 fly
63 food
3 fresh
1 fudge

2 goat
14 good
76 grease
6 greasy
1 grocer

1 healthful

1 indifference
1 ingredients

3 jam
2 jelly

1 kerosene
7 knife

15 lard
1 luxury

1 meal
2 meat
1 melt
2 melting
101 milk
1 molasses
1 mush

1 nourishment
2 nut

9 oil
3 oily
5 oleomargarine

1 peaches
3 plate
1 pleasant
1 plenty
1 pound
1 pure

2 rancid

13 salt
3 salty
1 salve
1 smear
1 smooth
65 soft
2 softness
1 sour
1 spoon
3 spread
1 square
2 strong
1 substance
4 sugar
1 supper
12 sweet

2 table
1 tallow
2 taste
2 tea
1 thin
1 tub

1 use

3 vegetable

80 yellow

82. DOCTOR

1 administer
8 aid
1 ailment
1 apparatus
2 attendant

1 bad
1 bag
2 beard
2 better
8 bill
2 bills
1 bottle
1 brains
1 brother
1 butcher

1 C.
1 C.
2 care
2 carriage
1 case
1 chief
1 clergyman
1 clever
1 college
1 convenient
9 cure

1 D.
1 D.
1 D.
1 death
4 dentist
5 disease
1 diseases
1 Divinity
1 doctress
1 dog
1 driving
1 Dr. P.
2 druggist

2 education

2 fakir
3 false
2 father
3 friend

1 G.
1 G.
1 gentleman
17 good
1 goodness
1 great
2 grip

5 healer
2 healing
18 health
3 help
1 helper
1 helpful
1 helpfulness
1 home
8 hospital

5 ill
21 illness
2 inquisitive
2 intelligent
1 interne
1 invalid

1 K.
1 K.
1 killer
1 kind

1 labor
1 laboratory
1 laborer
1 lamp
36 lawyer
1 learned
1 life

1 M.
1 McC.
1 McM.
1 magistrate
1 male
68 man
1 mean
19 medical
149 medicine
1 medicines
1 merchant
7 minister
1 mister
1 money
1 murder

1 N.
1 N.
2 necessity
1 need
1 needed
1 needful
1 nice
41 nurse
1 nurses

1 O.
1 office
1 old
1 one
1 operation

1 P.
2 pain
1 papa
23 patient
1 patients
1 people
3 person
1 pharmacist
1 physical
213 physician
1 pills
2 practitioner
6 priest
9 profession
3 professional

1 quack

6 relief
1 relieved
1 remedy

1 S.
3 satchel
2 science
1 scientist
52 sick
104 sickness
3 smart
1 student
1 suffering
1 supervisor
5 surgeon
1 surgical
1 syringe

1 tend
1 treatment
3 trouble
1 trust

2 useful
1 useless

1 W.
1 W.
1 W.
1 well
1 wise
2 woman
1 work

83. LOUD

3 angry
1 audible

1 band
1 bawl
5 bell
2 bells
2 birds
38 boisterous
1 boy
2 boys
1 bright

2 call
1 called
1 calliope
1 calm
12 cannon
1 check
1 child
1 children
1 city
1 clear
2 course
2 color
1 common
1 confusion
1 cornet

1 deaf
1 deafening
1 din

3 disagreeable
1 discontent
1 dislike
3 drum

3 ear
12 easy
4 explosion

3 fast
1 forte

1 game
1 gong
1 grapbopbone
2 gun
1 guns

2 hammer
2 hard
3 harsh
1 haugbty
6 hear
1 heard
4 heavy
14 high
1 hog
16 holler
4 born

1 impatient

2 knock

2 laugh
2 laughing
2 laughter
1 lofty
3 long
57 low

1 man
1 masculine
1 megaphone
1 mellow
1 mild
1 moutb
7 music

205 noise
112 noisy

1 objectionable
1 ocean
1 organ
1 owl

1 pain
1 painful
1 people
2 person
1 phonograpb
2 piano
1 piercing
1 pistol
1 pistols

1 power

32 quiet
1 quietness

1 racket
1 real
1 report
2 rougb
2 rude

1 S.
9 scream
2 sharp
1 shock
6 sbout
1 shouting
1 shriek
9 shrill
1 shrinking
3 silent
1 sing
1 singer
1 singing
4 slow
1 smart
1 smootb
1 socks
165 soft
1 softly
2 song
25 sound

2 sounds
3 speak
2 speech
2 spoken
7 still
1 stone
8 strong
1 subway
1 sweet

12 talk
1 talking
9 talker
9 thunder
1 tie
1 tone
1 trolley

1 uncomfortable
5 unpleasant

27 voice
1 voices
4 vulgar

2 whisper
17 whistle
1 wide
3 wind

3 yell
2 yelling

84. THIEF

1 absence
1 abstractor
1 anger
1 arrest

14 bad
1 badness
1 bandit
1 bank
3 beggar
1 being
1 betrayer
3 boy
118 burglar
2 burglary

2 careful
2 catch
4 caught
1 caution
1 chief
1 clerk
1 clothing
4 court
2 crime
15 criminal
3 crook
1 cry
2 culprit
1 cute

2 dangerous
4 dark
1 deceit
1 detective
1 devil
11 dishonest
2 dishonesty

1 dishonor
1 dislike
1 distrustful
1 dirt
1 dog
1 dumb

1 enemy
1 evil

2 fear
1 felon

1 girl
1 glove
2 gold
1 good

1 harsh
18 honest
4 honesty
4 house
1 bousebold

1 ignorant
1 injustice
1 interest
1 Irish

11 jail
7 jewelry
3 jewels
1 judge
1 jury
2 justice

1 killed
1 kleptomaniac

1 laugb
4 law
1 lawyer
6 liar
1 lock
3 loss
2 low

29 man
1 mask
1 McClure's
4 mean
1 meanness
1 men
1 mercenary
2 merchant
2 minister
1 mischief
1 misdemeanor
1 mistake
16 money
5 murder
3 murderer

1 necessity
1 neighbor
1 newspaper
16 night
1 none
1 noted

1 object

1 pencil
1 person
2 pickpocket
1 play
1 pocket

1 pocketbook
8 police
12 policeman
1 poor
6 prison
1 prisons
1 prisoner
2 punishment
1 purse

1 ran
4 rascal
1 reverses
1 revolver
8 rob
126 robber
10 robbery
19 rogue
1 roguisb
1 run
2 running

1 scare
1 schemer
1 school
4 scoundrel
1 shot
4 silver
1 silverware
1 sin
1 Sing Sing
1 sinner
1 sly
1 snake
7 sneak
3 sneaking
1 sneaky
1 spoils

212 steal
69 stealing
8 steals
9 stole
9 stolen
2 stealer
1 stealtb
2 stealthy

5 take
3 taking
1 time
2 tools
1 tramp
1 treasure
1 troublesome
1 trust

3 ugly
1 undesirable
1 unjust
1 unreliable

1 vagrant
2 valuables
2 vice
5 villain
1 virtue

1 want
3 watcb
1 waywardness
4 wicked
3 wickedness
1 window
1 woman
1 wretched
3 wrong

85. LION

4 Africa
1 Androcles
1 anger
2 angry
323 animal
3 animals

17 bear
57 beast
1 beautiful
1 beauty
2 big
1 bird
1 bite
1 blood
1 boisterous
2 bold
1 Bostock's
4 brave
1 bravery
1 Bronx

14 cage
1 camel
5 cat
1 cave
1 Christian
2 circus
2 claws
1 cow
1 crouching
2 cruel

5 cub
2 cubs

5 danger
6 dangerous
1 death
13 den
3 desert
1 devours
1 disturber
1 dog

1 eat
1 eats
3 elephant
1 enraged

3 fear
16 ferocious
1 ferocity
36 fierce
1 fierceness
6 forest
1 fox
1 fright
1 frightened

1 giraffe
2 great
1 growl

3 hair
1 hearted
1 holler
1 horse
1 howl
1 huge
1 hungry
3 hunter
4 hunting
1 hyena

1 interested

1 jealous
5 jungle
1 jungles

16 king

1 L.
6 lamb
3 large
10 lioness
1 lionized
1 lookout

1 majestic
3 majesty
13 mane
5 menagerie
1 mice
1 mighty
1 monkey
27 mouse
1 mule

1 N.
1 noble
1 noise

1 panther
2 park
1 paw
1 picture
5 power
1 powerful
1 prey

1 rage
1 raging
1 revenge
46 roar
3 roars
6 roaring
8 Roosevelt
1 rough

1 savage
1 sea
1 shaggy
1 sharp
1 sheep
1 small
1 stealth
1 stealthy
1 story
30 strength
15 strong
1 Sultan

4 tame
1 tamer
1 tail
1 teeth
1 terrible
102 tiger
2 tigers

7 ugly

5 vicious

1 walks
2 wicked
12 wild
1 wildness
2 wilderness
1 wilds
10 wolf
2 woods
1 wool
1 wrath

1 yellow

5 zoo
1 zoology

86. JOY

1 action
1 amuse
3 amusement
1 anger
1 angry
1 anticipation
1 arrival
4 automobile

1 ball
1 bird
1 birth
1 birthday
1 bitterness
1 bless
1 blessing
10 bliss
1 boy
1 bright
1 brightness
1 buoyant

1 cheer
2 cheerful
8 cheerfulness
2 child
1 children
2 Christmas
1 comes
11 comfort
1 comfortable
1 company
1 complete
1 concert
1 contentment

3 dance
5 dancing
6 delight
2 delighted
2 delightful
1 despair

1 ecstasy
3 elated
1 emotion
1 engaged
2 enjoyment
3 excitement
2 expression
1 extreme
1 exuberance

1 fair
1 family
1 feel
5 feeling
1 felt
1 festivity
2 fine
1 food
1 forever
1 friends
1 fullness
6 fun

1 gaiety
1 gay
1 game
1 gift
2 girl
1 girls
27 glad
44 gladness
3 glee
1 godliness
7 good
1 grand
7 great
18 grief

1 hands
215 happiness
71 happy
1 harmony
1 health
1 heard
3 heart
2 heaven
1 holiday
5 home
4 hope

1 inexpressible

1 joking
1 jubilant

1 lady
7 laugh
4 laughing
15 laughter
1 leap
1 letters
3 life
2 light
1 like
2 line
1 lonely
1 lots
6 love
2 loving
1 lovely

1 man
2 marriage
2 meeting
1 merriment
1 merry
7 mirth
1 money
1 motherhood
2 much
5 music

1 news
2 nice
1 noise

1 outing

1 pain
1 passing
23 peace
1 picnic
1 picnics
8 pleasant
3 pleased
121 pleasure
1 pride

1 quality

4 rapture
2 rejoice
1 rejoicing
2 relief
7 ride
2 riding
1 rider

1 sad
13 sadness
2 sailing
1 Saturday
1 seldom
1 sensation
1 shouting
2 show
1 sing
1 singing
2 smile
1 smiling
3 song
135 sorrow
1 sorry
1 state
1 suffering
1 summer
1 sunlight
5 surprise
4 sweet
1 sweetness

2 time
1 triumph
3 trouble

1 unalloyed
1 unattainable
2 unhappiness
1 unhappy

1 vacation

1 water
1 wedding
1 wetness
1 wish
1 wonderful
2 work
1 wrath

1 youth

87. BED

1 animal
1 asleep

1 baby
3 bedding
4 bedstead
4 blanket
3 blankets
1 boat
1 bowl
3 brass
2 bug

11 chair
2 clean
1 cleanliness
12 clothes
2 clothing
35 comfort
1 comforts
12 comfortable
11 cot
26 couch
1 counterpane
4 cover
4 covers
1 covering

1 desired
1 dormitory
1 down
1 dreamland

1 ease
1 easiness
2 easy

1 fatigue
3 feathers
1 flannels
1 floor
2 folding
1 frame
26 furniture

1 go
7 good

2 hammock
5 hard
1 head
2 bome
2 house

9 iron

1 joy

2 large
3 lay
1 laziness
21 lie
6 lounge
2 low
3 lying

1 make
1 marriage
21 mattress

1 narrow
1 negro
11 night

1 object

1 pan
3 patient
1 peace
17 pillow
7 pillows
1 pleasure
3 post

1 quilts

1 recline
1 recuperation
1 refreshing
1 repose
1 respite
132 rest
6 resting
1 restful
1 robe
16 room

1 seat
6 sheet
7 sheets
1 shoes
2 sick
5 sickness
345 sleep
41 sleeping
8 sleepiness
7 sleepy
3 slumber
7 sofa
31 soft
5 spread
1 spring
1 springs
1 square
1 stove
1 structure

2 table
1 tick
1 time
7 tired
1 twiligbt

1 Vassar

1 want
1 warm
1 weariness
2 white
1 whiteness
1 wide
4 wood

88. HEAVY

1 air
1 animal
1 anvil
1 article
1 automobile
1 avoirdupois

1 baby
1 bad
1 bat
2 bed
3 big
1 body
3 books
1 boulders
1 box
1 boxes
1 boy
1 bread
1 brick
1 building
1 bullet
4 bundle
12 burden
3 burdensome

1 cake
1 cannon
1 carpet
2 carry
1 carrying
1 cement
1 chair
1 change
1 cloth
1 clothes
1 cloudy
4 coal
1 coarse
1 coat
1 comfort
1 cumbersome

1 dark
1 difficult
1 dirt
1 disappointment
1 discomfort
1 dope
1 drag
1 drill
1 drowsiness
10 drowsy
3 dull

1 effort
3 elephant

1 F.
1 fall
1 feel
1 firmness
1 full

3 gold
1 gorgeous
1 grief
2 grip

3 hammer
38 hard
2 bead
1 beart
2 hearted
1 heft
1 help
2 horse
1 house

70 iron
2 irons

1 labor
2 laden
18 large
60 lead
7 lift
1 lifting
273 light
1 lightness
57 load
1 loadsome
1 loud

1 machine
4 man
1 marble
1 mountain
1 much
1 mud
1 muscle
1 myself

1 no

1 obliging
1 opposing
1 oppression
1 oppressive

1 package
1 pail
1 person
1 piano
2 ponderous
1 pound
1 pounds
2 pressure

1 quicksilver
2 quiet

2 rock
1 rough

2 safe
1 sand
1 satchel
1 scales
1 sharp
1 ship
1 short
1 sickness
3 sleep
1 sleeping
1 slothful
1 slumber
5 soft
1 soggy
3 solid
1 sound
1 steel
17 stone
2 stones
2 stout
3 stove
1 strain
4 strength
3 strong
1 study
1 suit

5 table
3 thick
1 things
1 thougbtful
21 tired
2 tiresome
4 ton
1 tough
3 trunk

1 uncomfortable
1 underwear

1 very

1 weak
3 weariness
3 weary
1 weather
1 weigh
1 weighing
177 weight
1 weighted
22 weighty
4 wood
2 work

89. TOBACCO

1 amber
1 anger

10 bad
1 bite
4 bitter
1 Bob
1 breath
7 brown

28 chew
13 chewing
19 cigar
17 cigars
12 cigarette
6 cigarettes
2 comfort
1 curse

1 death
1 decay
1 deviltry
6 dirty
8 disagreeable
1 disgust
1 disgusting
8 drug
1 Durham

1 elevate
1 enjoyed
1 enjoyment
1 execrable
1 exhilaration
1 evil

1 field
1 fields
4 filth
1 filthiness
1 filthy
1 food

1 garden
5 good
3 green
1 grower
1 growing

12 habit
1 habits
1 hard
3 herb
1 herbs
1 horrid
1 horrors

1 Indian
8 injurious
1 intoxicate

7 juice

17 leaf
2 leaves
1 light
1 liquor
1 lungs
2 luxury

8 man
1 men

10 narcotic
2 nasty
1 nausea
18 nicotine
1 none
1 not
1 nuisance

1 obnoxious
3 odor
1 odorous
4 opium

69 pipe
3 pipes
38 plant
1 plants
3 pleasant
2 pleasure
6 poison
1 poor
2 pouch
1 plug

1 refrain
1 ruin

1 scent
1 sensation
1 sin
5 smell
387 smoke
98 smoking
1 smoker
15 snuff
1 solace
4 spit
1 stalk
1 stars
2 stimulant
1 stimulants

7 strong
1 substance
1 suffocation
2 sugar
2 sweet

1 tasty
1 tobacco

1 unclean
2 unnecessary
2 unpleasant
1 unwholesome
2 use
1 used
1 useful
2 useless

3 vegetable
1 vice
2 Virginia

44 weed
1 weeds
1 whiff
1 whiskey
1 wickedness

1 yellow

90. BABY

1 animal

5 beautiful
2 beauty
1 beginning
3 being
1 bib
1 big
1 birth
1 blessing
1 blue
2 body
1 bonnet
2 born
6 bottle
82 boy
1 bread
1 buggy
1 bundle

1 cap
8 care
28 carriage
2 cart
239 child
3 children
1 childhood
1 chubby
4 clothes
3 comfort
22 cradle
1 creation
1 crib
1 crooning

2 cross
3 cries
87 cry
29 crying
8 cunning
8 cute
1 cuteness

4 darling
1 daughter
1 delicate
1 dirty
1 doll
6 dress

1 embryonic
1 eyes

1 fair
2 family
5 fat
1 father
1 feet
1 female
1 flesh
1 food
1 friend
1 future

26 girl
1 good
1 goodness
1 growth

1 happiness
1 happy
1 harmless
1 helpless
4 helplessness
4 home
3 human

168 infant
1 infinitésimal
10 innocence
4 innocent

7 joy
1 jump

4 kid

1 lamb
1 laugh
2 laughing
1 Lawrence
2 life
1 light
12 little
1 Lorenzo
9 love
1 loveliness
1 lovely

2 mama
4 man
1 mankind
1 Mary

1 milk
41 mother

1 name
5 nice
6 noise
1 noisy
8 nuisance
7 nurse

2 offspring

1 pacifier
1 paper
2 person
2 pink
1 play
1 pleasant
3 pleasure
1 population
1 powder
7 pretty

4 rattle
1 rocker
1 round
2 Ruth

1 sex
1 sick
1 sickness
1 simple
1 simplicity
2 sister

4 sleep
1 slight
42 small
1 smallest
1 smiling
8 soft
2 softness
2 squalls
1 squeal
1 squealing
1 stout
1 sunshine
23 sweet
7 sweetness
1 syrup

1 talk
1 talks
1 tiny
5 trouble
1 two

1 wagon
1 walking
1 weak
1 weakness
1 wee
1 white
2 wife
5 woman

2 yell
12 young
1 youngster
4 youth

91. MOON

1 astronomer
1 astronomy
1 atmosphere

2 ball
2 beam
1 beams
7 beautiful
6 beauty

7 body
52 bright
7 brightness
1 brilliant

1 calm
1 change
4 cheese
1 circle

1 circular
3 clear
2 clouds
4 cold
1 coldness
8 crescent
1 cute

2 dark

1 delicate
1 delightful
1 dim
4 distance
1 dreaming
5 earth
8 eclipse
1 equator
6 evening

1 fair
2 fire
1 firmament
10 full

1 girl
1 globe
1 glowing
1 grand

1 great
1 guard
3 half
2 heaven
3 heavens
4 high
1 illumination
1 lady
1 lake
9 large
281 light
3 love
1 loveliness
2 lovely
3 lunar
3 men
3 moonlight
1 mountain
1 mystery
1 necessary
3 new
66 night
1 object
1 ocean
1 one
1 orbit
2 pale
23 planet
1 planets
1 pleasant
1 quiet
1 reflection
1 rise
1 rises
1 rising
33 round
4 satellite
2 sea
1 see
1 seeing
1 sentimental
26 shine
4 shines
12 shining
12 shiny
4 silver
6 silvery
1 size
73 sky
1 solar
1 sound
1 splendid
2 spoon
1 spooning
32 star
93 stars
1 starlight
1 steamer
1 stone
2 struck
120 sun
1 sweet
1 turkey
1 valuable
1 wan
2 water
3 white
1 wish
11 yellow

92. SCISSORS

1 apart
4 article
2 barber
1 blade
1 blades
1 blunt
35 cloth
1 clothing
1 cord
1 crooked
2 crossed
347 cut
114 cutting
1 cutlery
1 dress
2 dressmaker
3 dressmaking
5 dull
1 edge
1 fate
1 firecrackers
1 flowers
2 garments
1 glistening
5 goods
1 grating
7 grind
1 handle
1 handy
6 implement
36 instrument
1 instruments
66 knife
6 knives
1 lever
1 linen
1 lost
2 machine
1 material
1 metal
1 millinery
1 mother
1 nails
1 necessity
4 needle
4 needles
1 nickle
1 nippers
6 paper
1 point
1 pointed
1 razor
1 rubbing
1 Sarah
1 screw
1 severing
2 sew
10 sewing
190 sharp
5 sharpness
1 sharpen
40 shears
2 shut
1 silver
1 skirt
1 spool
23 steel
1 string
2 tailor
3 thimble
4 thread
1 tongs
10 tool
1 tools
1 trousers
1 useful
1 usefulness
1 utensil
1 weapon
1 woman
2 work

93. QUIET

1 action
2 alone
1 always
1 asleep
2 baby
1 beautiful
1 beauty
1 bed
2 behave
3 boisterous
1 bore
1 boy
1 breeze
1 brook
1 butterfly
20 calm
1 cattle
6 child
1 children
4 church
1 color
2 comfort
1 comfortable
1 composed
2 contented
21 country
1 Creal
1 cricket
3 cross
3 dark
1 darkness
3 day
2 death
1 degree
3 demure
1 disposition
1 docile
1 dreary
1 dull
1 dumb
8 ease
1 easiness
49 easy
5 evening
1 family
1 feeling
1 genteel
3 gentle
1 gentleman
2 girl
7 good
1 green
1 happy
2 harmless
1 harsh
1 heaven
6 home
1 hour
3 house
2 hospital
1 humble
1 joy
1 landscape
1 laughing
1 library
2 life
1 like
1 loneliness
3 lonely
2 lonesome
1 looks
1 lovely
48 loud
1 low
1 man
1 melancholy
1 mind
1 Miss K.
1 moon
1 mountains
1 music
1 myself
1 nature
2 nice
38 night
50 noise
16 noiseless
1 noisiness
113 noisy
1 nook
1 park
26 peace
2 peaceable
52 peaceful
4 peacefulness
2 people
1 person
4 place
4 pleasant
3 pleasure
1 quick
2 quite
1 rabbits
1 refined
1 relief
6 repose
1 reserved
68 rest
4 resting
19 restful
2 restless
6 room
1 rough
1 sad
1 sea
1 serene
1 sheep
1 sickness
13 silence
15 silent
24 sleep
3 sleeping
1 sleepy
3 slow
1 slowness
1 slumber
1 slumbers
1 smart
1 smooth
1 sober
10 soft
1 softly
1 softness
3 solemn
2 solitude
3 soothing
4 sound
2 soundless
1 speechless
1 state
2 steady
136 still
16 stillness
2 study
1 stupid
1 subdued
1 summer
1 Sunday
2 sweet
2 talk
1 time
1 times
1 timid
1 tomb
1 tranquil
1 tree
1 twilight
1 village
1 violent
1 voice
1 walk
1 water
1 well
1 Wilton
1 wish
1 wood
10 woods

94. GREEN

8 apple
2 beautiful
1 bird
13 black
1 bloomy
2 blotter
46 blue
1 book
5 bright
8 brown
1 butterfly
1 cabbage
1 calm
1 carpet
1 cheese
3 cloth
200 color
1 colors
1 comfort
1 corn
1 country
1 covetous
2 cucumber
1 curtain
8 dark
1 Dartmouth
1 definite
6 dress
2 earth
3 envy
1 Erin
4 eyes
1 farmer
1 favorite
12 field
10 fields
3 flag
4 flower
2 flowers
2 foliage
1 food
1 foolishness
1 forest
3 fresh
1 fruit
1 gay
1 glasses
1 gold
1 grand
1 grapes
284 grass
5 gray
1 grew
1 grief
1 ground
1 hat
1 hill
2 horn
1 horrid
1 hue
6 Ireland
14 Irish
1 jealousy
1 landscape
1 laurel
5 lawn
8 leaf
13 leaves
4 light
1 meadow
1 meadows
2 mountain
1 name
4 nature
1 ocean
1 olive
2 orange
3 paint
2 paper
1 peaceful
2 peas
11 pink
6 plant
1 plants
2 pleasant
1 pleasing
4 pretty
6 purple
2 quiet
42 red
6 restful
2 ribbon
2 ripe
2 sea
4 shade
2 shamrock
1 shutters
1 sight
1 silk
1 sky
1 slow
1 small
1 soft
2 sour
1 spinach
9 spring
1 stain
1 summer
1 tea
10 tree
29 trees
1 unripe
1 vegetable
1 vegetables
3 verdant
1 verdure
1 warning
1 wearing
31 white
1 wood
2 woods
54 yellow
1 young

95. SALT

1 acrid
3 air
1 apple
2 apples
1 article
1 barrel
1 barren
1 bath
1 beef
40 bitter
1 bowl
1 box
2 bread
2 brine
1 bromide
7 butter
2 celery
9 cellar
2 chemical
1 codfish
2 condiment
1 cook
2 cooking
1 cows
1 cream
1 deposit
1 digestible
3 dinner
1 dirt
1 disagreeable
1 dish
1 drink
2 dry
6 earth
17 eat
7 eatable
8 eating
2 eggs
1 epileptics
1 finish
4 fish
21 flavor
3 flavoring
46 food
1 France
11 fresh
1 glass
9 good
1 halite
1 ham
4 hard
1 horrid
1 ice-cream
1 ingredient
1 Kenilworth
1 kitchen
1 Lake
1 life
1 lot
4 mackerel
1 marsh
18 meat
1 meats
1 medicinal
1 melt
2 mine
3 mines
37 mineral
1 mustard
1 NaCl
5 necessary
3 necessity
1 needed
1 needful
1 nice
36 ocean
1 pantry
1 paper
1 pasture
142 pepper
1 petre
1 physic
1 pickles
5 pork
1 potassium
2 potato
4 potatoes
1 powder
1 preparation
2 preservation
1 preservatives
1 preserving
1 quotation
1 refreshing
4 relish
7 rock
1 rocks
1 saline
1 saltpetre
3 salty
1 sandwiches
1 Saratoga
1 saving
10 savor
1 savory
18 sea
12 season
31 seasoning
2 shake
4 shaker
8 sharp
1 sheep
1 smart
1 snapping
1 sodium
2 soup
18 sour
5 spice
1 spill
1 stickiness
88 sugar
1 sustenance
27 sweet
1 Syracuse
14 table
2 tart
87 taste
1 tasting
2 tasteful
6 tasty
1 tasteless
1 temper
4 thirst
2 thirsty
1 trees
7 use
2 useful
1 uses
1 using
5 vegetable
1 vegetables
1 victuals
1 vinegar
34 water
2 wet
36 white

96. STREET

1 air
18 alley
6 asphalt
1 automobiles
63 avenue
1 avenues
1 better
1 bitter
12 block
3 boulevard
1 Bowery
2 boy
1 brick
2 broad
6 Broadway
1 Brooklyn
1 building
1 business
4 busy
1 byway
10 car
8 cars
1 carriage
82 city
1 Clarkson
7 clean
1 cleaner
1 colors
1 confusion
1 congestion
2 corner
1 country
2 crooked
1 cross
3 crowd
1 crowded
1 dark
1 Devon
1 direct
1 directions
4 dirt
5 dirty
1 distance
1 drive
1 driving
2 driveway
1 dry

4 dust
5 duaty
1 dwellings

1 earth
1 Eighty-aixth
1 Eleventh
1 Elm
1 even

1 fertile
1 Fifteenth
1 fine
2 flags
1 Forty-third

1 garden
1 going
1 gravel
2 gutter

1 hard
1 heat
1 Hester
7 highway
1 home

2 horaes
1 hot
11 house
21 houses
1 huatle

3 land
21 lane
1 large
1 length
1 level
1 light
2 live
2 location
1 lonely
29 long

5 Main
1 Market
1 Maxfield
1 motion
1 mud
1 muaician

2 name
21 narrow
3 New York

1 nice
8 noise
5 noisy
12 number
1 numbers

1 One-fifteenth
1 One-sixteenth
1 opening

11 passage
1 paasageway
2 passway
12 path
2 pathway
1 pave
13 paved
25 pavement
1 paving
1 pebble
1 Pecan
22 people
16 place
2 pleasant
1 pleasure
2 pretty

1 racket
1 residence
91 road
4 roads
2 roadway

1 aee
1 ahopping
3 short
26 sidewalk
2 sidewalks
1 Sixty-seventh
2 Sixty-third
2 smooth
1 space
4 aquare
8 stone
8 atonea
17 straight
1 sun
1 aweep

1 tsnements
1 terrace
23 thoroughfare

26 town
1 tracks
7 traffic
3 travel
1 tree
1 trees
2 trolley
1 turmoil

1 vehicles
9 village

3 wagon
2 wagons
78 walk
23 walking
2 walks
1 Wall
1 Washington
14 way
1 wet
1 white
35 wide
1 width
1 Woodhull

97. KING

1 Albert
1 all
8 Alphonso
1 antiquity
1 Arthur
4 authority

1 bad
1 boss

1 card
1 cards
2 chess
1 chief
8 command
1 commanding
9 commander
2 conqueror
13 country
1 court
1 courtier
63 crown
2 crowned

1 daughter
1 diamonds
1 dignity
1 dislike

1 dog
1 duke

30 Edward
11 emperor
3 empire
20 England
1 ermine

1 family
1 farce
1 first
1 fool
1 foreign
1 friend

1 garment
2 George
1 glory
1 good
1 govern
4 government
6 governor
2 great
1 greatness

1 Hamlet
1 happy

8 head
1 helmet
2 Henry
2 high
1 Holland
1 honorahle
1 horrihle

1 imperial
1 inheritance
1 Italy

1 John
1 judgment

2 Kaiser
1 king
5 kingdom

1 large
1 law
2 leader
1 lion
1 lord
1 Louis XVI.
1 loyal

1 majestic

8 majesty
2 male
43 man
8 master
1 mean
1 Midaa
49 monarch
4 monarchy

1 nation
1 nohility
3 nohle
2 nohleman
1 none

1 officer
1 old

2 palace
6 person
1 picture
2 pompoua
18 power
4 powerful
4 president
1 princesa
1 Prussia

354 queen

1 regal
1 regent
8 reign
1 rich
1 Richard
2 royal
5 royalty
10 rule
4 rules
162 ruler

1 Saxony
2 sceptre
1 slave
1 somehody
8 sovereign
1 Spain
1 atories
2 suhject
1 aupreme

21 throne
1 title
1 town
1 tyrant

98. CHEESE

2 American

1 hacteria
2 had
2 beer
1 hiscuit
6 hitter
2 box
56 bread
1 brick
136 butter
2 huttermilk

8 cake
2 Camembert
1 cssein
1 chalk
1 cheeaecloth
1 churn
4 cloth
1 cold
4 color

1 corn
9 cow
8 cowa
1 cracker
30 crackera
30 cream
1 creamery
1 crust
9 curd
3 curda
2 cut
1 cutter

4 dairy
2 delicatessen
1 derhy
2 diet
1 digestihle
1 digestion
2 dinner
1 dish
4 dislike

1 Dutch

1 eagle
67 eat
29 eating
1 eaten
19 eatable
3 eatahles
1 edible
2 eggs

1 factory
2 fat
1 feast
1 fine
1 fondnesa
91 food
2 fresh
1 fromage de Brie

15 good

5 green
1 grocer
1 grocery

1 ham
2 bard
1 head
1 heap
2 hole
2 holes
2 holey
1 hoopa
1 hunger
1 hungry

1 indigestion

1 jam

1 kind
4 knife

13 Limhurger

1 lump
2 lunch

1 macaroni
1 maggot
2 maggota
1 meat
25 mice
1 microhes
1 mild
106 milk
1 milky
1 mixture
2 moon
1 mould
1 mouldy
13 mouse
2 mustard

1 nice
1 nourishment
1 nutrition

9 odor
1 odorous

1 pickles
6 pie
1 plain
1 plate
1 poor
1 poultry
1 price
2 product

4 rarebit
8 rat
7 rats
1 red
1 resentment
1 rich
4 Roquefort
1 rough
2 round

1 sage

1 salt
8 sandwich
2 sandwicbes
1 sauce
1 scent
2 Switzer
3 sharp
1 skippers
33 smell
1 smells
7 soft

2 solid
5 sour
1 strengtbening
12 strong
1 sugar
5 supper
2 sweet
16 Swiss
1 Switzerland

8 taste

1 tasty
1 thin

5 vegetable
1 vegetables

1 wafers
3 white
1 worms

32 yellow

99. BLOSSOM

60 apple
4 apples
1 art

10 beautiful
9 beanty
1 beginning
1 berries
28 bloom
7 blooming
1 blow
1 book
4 bright
23 bud
3 huds
1 bursting
1 hush
2 bushes
1 buttercups

5 cherries
4 cherry
1 clematis

1 clover
5 color
1 colors
1 country

1 dainty
2 daisy
1 delicate

1 eat

2 fair
1 falling
1 falls
3 field
1 fields
467 flower
73 flowers
1 foliage
2 forth
6 fragrance
4 fragrant
1 frail

39 fruit

2 garden
1 gin
1 girl
1 green
2 grow
2 growth

1 handsome
1 happiness
1 bepatica

3 leaf
1 leaves
2 lilacs
1 lily

1 magnificent
2 May
1 mimosa

1 nice

2 odor
2 orange
2 orchard

1 pansies
1 pansy
1 peacefulness
4 peach
1 petal
1 petals
1 picking
7 pink
13 plant
1 pleasure
1 plum
1 pour
15 pretty

3 red
17 rose
1 roses

1 scent

1 seeds
1 shrubberies
1 small
2 smell
1 soft
23 spring
1 sprout
1 stem
4 summer
1 sun
15 sweet

1 T.
40 tree
17 trees

1 vine
3 violet

1 weeds
8 white

2 yellow
1 youth

100. AFRAID

1 accidents
1 action
2 alarm
2 always
3 anger
2 angry
2 animal
2 animals
1 anxiety
2 automobile
1 awful

1 backwardness
2 bad
2 bashful
1 battle
1 bears
1 blow
2 bold
1 boy
18 brave
1 bravery
1 brother
3 burglar
2 burglars

1 careful
2 cat
1 cheerfulness
8 child
1 children
1 cold
1 comfort
1 comforted
1 company
1 confidence
1 conscience
11 courage
5 courageous
1 cow
1 cows
[illegible] coward

5 cowardice
3 cowardly
1 crowd
1 crying

15 danger
2 dangerous
1 dare
114 dark
16 darkness
2 death
1 deep
1 depressed
1 desire
1 dislike
1 do
1 dog
1 dogs
1 don't
1 doubt
7 dread
1 dreading
1 dreadful
1 dream

2 emotion

2 faith
197 fear
8 fearful
8 fearless
2 feeling
1 fierce
1 forward
9 fright
2 frighten
48 frightened
1 frightful
1 frog

1 gallant
4 ghost

2 ghosts
1 girl
4 go
1 goblins
1 God
1 guilty

1 happy
2 harm
1 heart
1 heroism
1 hide
1 home
1 hope
1 horse
1 hurt

1 insect

1 joy
1 joyful

1 licked
1 lightning
3 lion
1 loneliness
3 lonely
5 lonesome
1 loss

3 man
1 manner
1 memory
1 mild
1 Miss K.
1 mice
2 mouse

1 need
2 nerve
1 nerves
55 nervous

4 nervousness
3 never
12 night
3 no
1 nobody
2 noise
1 noisy
1 not
5 nothing

1 obsession
1 opposition

1 palpitation
1 patient
1 patients
1 plucky
1 police

1 quiet

1 rat
1 rats
1 retreat
1 riot
2 robbers
1 rocks
4 run
1 running

1 scare
106 scared
1 scary
1 scream
1 sensitive
1 shiver
2 shrinking
1 shudder
2 shy
1 sickness
1 sleep

1 soldier
1 somebody
1 sore
2 sorrow
1 sorry
1 spirit
1 spiritual
1 startled
1 startling
1 stay
1 stillness
1 strong
1 suddenness
1 suffering
1 sure

1 tempted
1 terrified
9 terror
3 thief
1 thought
1 threaten
1 thunder
55 timid
2 timidity
1 timorous
1 to-night
2 tremble
1 trouble
1 trust

1 unable
1 uncertain
5 uneasy
1 unhappiness
1 unknown
1 unprotected

1 woman
1 women
1 worried
3 worry

APPENDIX TO THE FREQUENCY TABLES

General Rules

1. Any word combination which is to be found in the frequency tables, but only in the reverse order from that in which it occurs in a test record under consideration, is to be classed as a normal reaction.

2. Any reaction word which is a synonym or an antonym of the corresponding stimulus word is to be classed as normal.

1. TABLE

Any food or meal.
Any room or apartment.
Any article of table linen, china, silver, or furnishings.
Word designating any special variety of tables.
Any word pertaining to appetite.

2. DARK

Any source of illumination.
Any enclosure from which light is wholly or in a large measure excluded.
Word referring to physiological pigmentation of tissues exposed to view.
Any division of the diurnal cycle.
Any color or coloring material.
Anything which obscures light.

3. MUSIC

Any musical instrument.
Name of any composer or musician.
Special or general name of any musical composition.
Term designating rhythm, tempo, loudness, or pitch.
Name of any dance.
Term expressing subjective effect of music.

4. SICKNESS

Term designating any disease, symptom, injury, or physiological function.
Any cause of disease.
Any means or measure of treatment of disease.
Any anatomical organ or region.
Word denoting mode of termination, results, consequences, or indirect effects of disease.
Any term of prognostic import.
Common or proper name of any person.

5. MAN

Word denoting or implying age of a person.
Any of the well-known male sexual characteristics.
Occupation or profession more or less peculiarly masculine.
Word pertaining to familial relationships or domestic organization.
Word pertaining to sexual relationships; any word denoting the opposite sex.
The proper name of any male person.
Any article of male apparel.

6. DEEP

Any vessel or container.
Any natural or artificial body of water.
Any depression of surface.
Any object naturally situated or often artificially placed at a comparatively great distance below the surface.
Any act of progress from surface to depth.

7. SOFT

Any article of food.
Any fabric.

8. EATING

Any article of table linen, china, or silver.
Any organ of digestion; any function of nutrition.
Any article of food; any meal.
Any private or public eating place.
Word denoting taste.

9. MOUNTAIN

Name of any mountain, mountain range, or mountainous country.
Word pertaining to shape, geological composition, fauna, or flora of mountains or mountainous regions.
Any term of physical geography.

10. HOUSE

Any place of house location.
Any part of a house.
Any material used in the construction of a house.
Any part of the process of construction of a house.
Laborer or mechanic having to do with the construction of a house.
Any commercial term pertaining to ownership, taxes, mortgages, sale, renting, or occupancy of a house.
Any article of furniture.

11. BLACK

Any object or substance that is always or often black or dark in color.
Any color.
Word denoting limitation or obscuration of light.
Any word clearly related to the word Black used as a proper name.

12. MUTTON

Any article of food; any meal.
Any animal, or class or group of animals, whose meat is used for human consumption as food.
Any article of table linen, china, silver; any cooking utensil.
Word designating any person engaged in the preparation of meats for consumption.
Word denoting any process employed in the preparation of meats for consumption.

13. COMFORT

Any agreeable or disagreeable subjective state.
Any object, act, or condition that contributes to comfort or produces discomfort.

14. HAND

Any simple function of the hand; work requiring special manipulation.
Word denoting skill or any degree of skill.
Any part or any tissue of the body.

15. SHORT

Any word involving the concept of duration.
Common or proper name of any person.
Any word denoting shape, relative or absolute dimension, or distance.
Any object in which characteristically one dimension exceeds any other.

16. FRUIT

Any article of food; any meal.
Any process employed in the cultivation of fruits or in their preparation for consumption.
Word designating any person engaged in the cultivation of fruits or in their preparation for consumption.
Any article of table linen, china, or silver.

17. BUTTERFLY

Any bird, worm, or insect.
Any flower.
Any color.

18. SMOOTH

Any object possessing a smooth surface as a characteristic feature.
Any fabric.

19. COMMAND

Word denoting any means of influence of one mind upon another intended to produce acquiescence.
Word denoting or implying acquiescence or lack of it.
Term applied to any commanding officer or to any person in authority.

20. CHAIR

Any article of furniture.
Any room or apartment.

21. SWEET

Any substance having a sweet taste.
Common or proper name of a child or woman.

22. WHISTLE

Any instrument or any animal producing a shrill musical sound.

23. WOMAN

Word denoting or implying age of a person.
Any of the well-known female sexual characteristics.
Occupation or profession more or less peculiarly feminine.
Word pertaining to familial relationships or domestic organization.
Word pertaining to sexual relationships; any word denoting the opposite sex.
Name of any female person.
Any article of female apparel.

24. COLD

Name of any location characterized by low temperature.
Any illness or symptom which may be caused by exposure to cold.
Any division of the annual cycle.
Any food that is always or often served cold.
Any means or measure of protection against cold.
Any state of the natural elements causing a sensation of cold.
Word denoting subjective characterization of or reaction to cold.

25. SLOW

Any means or manner of locomotion.
Any word involving the concept of rate of progress with reference either to time or to intensity of action.
Common or proper name of any person.

26. WISH

Word implying fulfillment of a wish either by achievement or through acquiescence.
Word implying non-fulfillment of a wish.
Word denoting any state of longing or anticipation.
Word denoting any state free from longing or anticipation.
Word denoting a prayer or request.
Word denoting a state of happiness.

27. RIVER

Any body of water.
Any part of a river.
Any plant or animal living in rivers.
Any term of physical geography.
Any vessel or contrivance for navigation.

28. WHITE

Any object or substance that is always or often white or very light in color.
Any color.
Any word clearly related to the word White used as a proper name.

29. BEAUTIFUL

Any word denoting aesthetic pleasure.
Name of any female person.
Any product of the fine arts or of decorative handicraft.
Any decorative plant or flower.
Any article of attire.

Natural scenery.
Any division of the diurnal cycle.

30. WINDOW

Any word pertaining to illumination.
Word pertaining to movements of air.
Any attachment to a window for the control of transmission of light or air.
Any building or apartment.

31. ROUGH

Any object or substance which is characteristically rough to the touch.
Word denoting or implying irregularity of surface.
Any skin lesion which may impart to the skin the quality of roughness.
Any word implying carelessness, lack of consideration, or crudeness; any word used to designate action or conduct which may be characterized as careless, inconsiderate, or crude.

32. CITIZEN

Any word pertaining to political organization, or to factors either favorable or unfavorable to it.
Any term or proper name of political geography.
Common or proper name of any male person.

33. FOOT

Any means or manner of locomotion involving the use of the feet.
Any part or any tissue of the animal body.
Any article of foot-wear.
Any way constructed or used for walking.
Any unit of linear measure.

34. SPIDER

Word employed to designate subjective characterization of or reaction to an object of dislike.
Any insect.
Word pertaining to the characteristic habits of spiders, with reference either to location and construction of nest, or to manner of catching prey.

35. NEEDLE

Any material used in making clothes.
Any special sewing operation; any occupation in which sewing constitutes part of the work.

Any special kind of needles.
Any instrument which is used in connection with a needle in any operation, or of which a needle forms a part.

36. RED

Word which may be used to express subjective characterization of the red color.
Any object or substance which is always or often red in color.
Anything which is by convention or common usage connected with the red color.
Any organ, tissue, or lesion, exposed to view, which may have a red color imparted to it by the blood or by physiological pigment.
Any color or coloring material.
Any word implying light through incandescence.

37. SLEEP

Word denoting somnolence or a state of lowered consciousness; anything which is a cause of somnolence or of lowered consciousness; anything which induces a desire to sleep.
Word denoting a state of active consciousness or a transition from lowered to more active consciousness.
Any division of the diurnal cycle.
Any word more or less commonly used to characterize sleep in any way.
Any article of bedding, bed-linen, or night-clothes.
Any article of furniture used for sitting or lying.

38. ANGER

Any affective state; any common demonstration of emotion.
Any common cause or provocation of anger.
Action or conduct caused by anger; word used to characterize such action or conduct.

39. CARPET

Any material of which carpets are made.
Any article of house furniture, hangings, or decorations.
Word denoting home, house, or any part of a house.
Word pertaining to the manufacture or care of carpets, or denoting a person engaged in the manufacture, sale, or care of carpets.
Any country especially noted for the manufacture of carpets or rugs.
Any color.

40. GIRL

Word denoting or implying age of a person.
Any of the well-known female sexual characteristics.

Occupation or profession more or less peculiarly feminine.
Word pertaining to familial relationships or domestic organization.
Word pertaining to sexual relationships; any word denoting the opposite sex.
Name of any female person.
Any part of a person's body.
Any article of female apparel.

41. HIGH

Any word denoting or implying skill, training, achievement, or position.
Any word denoting or implying valuation.
Any architectural structure.
Any object of which the vertical dimension characteristically exceeds any other.
Any act of progress from a lower to a higher level.
Name of any mountain or mountain range.
Anything characteristically situated at a high level.
Anything characteristically variable in height.

42. WORKING

Any occupation, profession, art, or labor.
Direct results or consequences of work.
Any place of employment.
Rest, recreation, inaction, or disinclination to work.
Word denoting energy, material, capital, equipment.

43. SOUR

Any substance or object which is always or often sour in taste.
Any word denoting a taste or flavor quality.

44. EARTH

Any substance which enters into the composition of soil.
Word pertaining to the utilization or cultivation of natural resources; any product of agriculture.
Any term of physical geography, geology, mineralogy, meteorology, or astronomy.

45. TROUBLE

Any affective state.
Any general cause of active emotional states.
Any common manifestation of emotion.
Word denoting or implying defeat.
Word denoting or implying caution or lack of it.
Any task.

46. SOLDIER

Word pertaining to military organization.
Word pertaining to any military operation.
Word pertaining to military discipline or to military decoration.
Any article of military or naval equipment or attire.
Common or proper name of any male person.
Name of any country.
Word pertaining to political organization.

47. CABBAGE

Any article of food; any meal.
Any article of table linen, china, silver; any cooking utensil.
Any process of cooking.
Word used to designate any person engaged in the cultivation of cabbages or in their preparation for consumption.

48. HARD

Any solid article of food.
Word denoting or implying impact.
Any task or labor.
Any substance which is hard or unyielding.
Any agency or process by which a substance is solidified or hardened.
Any article of furniture used for sitting or lying.
Any trait of disposition characterized by lack of readiness to yield or lack of consideration for others.

49. EAGLE

Any bird.
Any piece of currency.
Anything in connection with which the word eagle is used in a symbolic sense.

50. STOMACH

Any anatomical organ or region.
Any article of food; any meal.
Word pertaining to ingestion and assimilation of food.
Term denoting health or disease; any medicament.

51. STEM

Any object which has a stem.
Any part of a plant.
Any object which is long, slender, and more or less rigid.

52. LAMP

Any means or source of illumination.
Word denoting or implying illumination.

53. DREAM

Any product of imagination.
Any psychical phenomenon; any part of the psychical organ.
Word denoting or implying unreality or uselessness.
Word denoting or implying mystery or occultism.
Any division of the diurnal cycle.
Any article of bedding, bed-linen or night-clothes.
Any article of furniture used for sitting or lying.
Any narcotic substance.

54. YELLOW

Word which may be used to denote subjective characterization of the yellow color.
Any object or substance which is always or often yellow in color.
Any color or coloring material.

55. BREAD

Any article of food; any meal.
Any article of table linen, china, or silver; any cooking utensil.
Any private or public eating place.
Word pertaining to ingestion and assimilation of food.
Any ceremony in connection with which bread is used.

56. JUSTICE

Any word implying crime or tendency to crime, legal trial, retribution or lack of it, or repentance.
Any officer of the law.
Word pertaining to judiciary organization.
Word denoting any kind of ethical relationship.
Any deity.
The name of any justice or judge.
Any function of a judicial authority.
Any word denoting or implying equality.

57. BOY

Word denoting or implying age of a person.
Word pertaining to familial relationships or domestic organization.
Word pertaining to sexual relationships; any word denoting the opposite sex.

Common or proper name of any male person.
Any part of a person's body.
Any article of male apparel.
Any common boys' toy or game.
Word pertaining to educational organization.

58. LIGHT

Any source, apparatus, or means of illumination.
Any color or coloring material.
Word implying light through incandescence.
Any term of optics; any optical phenomenon.
Any object or substance which is characteristically light in weight.

59. HEALTH

Any emotion; any common manifestation of emotion.
Any disease or symptom.
Word pertaining to prevention or treatment of disease.
Word pertaining to any normal bodily function.
Word pertaining to the preservation of health.
Word denoting or implying a state of health.
Any athletic sport or form of exercise.
Any anatomical organ or region.

60. BIBLE

Name of any personage mentioned in the Bible.
Any religion or religious denomination.
Any name or attribute employed in reference to the Deity.
Any article or act of religious ritual.
Word denoting or implying belief, disbelief, or doubt.
Any term of theology.

61. MEMORY

Word pertaining to operations, faculties, endowment, training, or condition of the mind.
Word denoting any degree of accuracy.
Word denoting the cranium; any part of the psychical organ.
Word pertaining to the past.
Any word implying transiency.
Any subject of study involving the exercise of memory.
Any method or means for the reinforcement of memory.
Any of the senses.
Word denoting retention.

62. SHEEP

Any animal raised or hunted for clothing material, for food, or for its services as a beast of burden.
Any product manufactured from the skin or wool of sheep.
Any of the more or less distinctive characteristics of sheep.
Any food product derived from sheep.

63. BATH

Word denoting or implying an effect of bathing on the body.
Any body of water.
Any kind of bath; any part of bath, lavatory, or toilet equipment.
Any material of which a bathing equipment is largely made.
Word denoting a state of partial or complete undress.
Any beach or bathing resort.
Any aquatic feat of gymnastics.

64. COTTAGE

Word pertaining to landscape gardening.
Any place of cottage location.
Any part of a house; any color.
Any material used in the construction of a cottage.
Any laborer or mechanic having to do with the construction of a cottage.
Any part of the process of construction of a cottage.
Any commercial term pertaining to ownership, taxes, mortgages, sale, renting, or occupancy of a cottage.
Any article of furniture.

65. SWIFT

Any means or manner of locomotion.
Word denoting or implying motion or rate of motion.
Any animal or familiar object characterized by rapid locomotion.
Any word clearly related to the word Swift used as a proper name.

66. BLUE

Word which may be used to express subjective characterization of the blue color.
Any object or substance which is always or often blue in color.
Anything which is by convention or common usage connected with the blue color.
Any organ, tissue, or lesion, exposed to view, which may have a blue color imparted to it by the blood or by physiological pigment.
Any color or coloring material.

67. HUNGRY

Any animal.
Any article of food; any meal.
Word denoting taste or flavor.
Word denoting or implying privation or torture.
Any article of table linen, china, or silver.
Any private or public eating place.
Any organ of digestion; any function of nutrition.
Word designating any person engaged in the preparation or sale of foods.

68. PRIEST

Any religion or denomination.
Any article or act of religious ritual.
Any term of theology.
Word denoting or implying sanctity.
Word denoting or implying belief, disbelief, or doubt.
Word pertaining to church organization.
Proper name of any priest.
Any article of clerical attire.
Any profession more or less peculiarly masculine.

69. OCEAN

Any body of water.
Any plant or animal living in the ocean.
Any term of physical geography.
Any vessel or contrivance for navigation.
Word pertaining to navigation; any nautical term.
Common or proper name of any place bordering on the ocean.
Any aquatic feat of gymnastics.

70. HEAD

Any organization which has a person occupying the highest office.
Word denoting or implying the highest office of any organization.
Any intellectual faculty, quality, or operation.
Any part of the head.
Any pathological condition affecting the head.

71. STOVE

Any part of a stove.
Any kitchen utensil.
Any artificial heating apparatus; any fuel.
Any manner of cooking; any person engaged in cooking food.
Any article of household furniture.

72. LONG

Any word involving the concept of duration.
Word denoting shape, relative or absolute dimension, or distance.
Any object in which characteristically one dimension exceeds any other.

73. RELIGION

Any religion or denomination; the name of any race or nation.
Any term of theology.
Any branch of metaphysical philosophy.

74. WHISKEY

Any beverage; the name of any brand of whiskey.
Any material of which whiskey is made.
Word denoting taste or flavor.
Any occasion or ceremony commonly associated with the use of alcoholic beverages.
Word denoting a state of lowered consciousness.
Any physiological or pathological effect of alcohol; also any well-known indirect effect.

75. CHILD

Word denoting or implying age of a person.
Word pertaining to familial relationships or domestic organization.
Name of any person.
Any part of a person's body.
Any article of a child's apparel.
Any common child's toy or game.
Word pertaining to educational organization.
Any word descriptive of the natural physical or mental make-up of a child, or of the rate or degree of physical or mental development.
Word pertaining to any custom or ceremony connected with the birth or rearing of children.
Any term of obstetrics.
Any word clearly related to the word Child used as a proper name.

76. BITTER

Any substance having a bitter, sour, sweet, or salt taste, or a complex taste quality which may be characterized as strong.
Word denoting a taste or flavor quality.
Any organ of taste.
Any word in connection with which the word bitter may be used in the sense of poignant.

77. HAMMER

Any tool or weapon.
Any trade involving the use of a hammer.

78. THIRSTY

Any beverage.
Any animal.
Word denoting taste or taste quality.
Any part of the upper end of the digestive tract.
Any drinking place; any container of a beverage.
Any fruit; any dessert.
Any food ingredient commonly known to excite thirst.

79. CITY

Name of any division of political geography.
Any architectural structure.
Any part of a city.
Word pertaining to the political organization of a city.

80. SQUARE

The name of any city.
The name of any square in a city or town.
Any geometrical figure or part of one.
Any object that is always or often square in shape.
Any device used in the arts for measuring angles, arcs, or distances between points.
Any part of a carpenter's or draughtsman's square.
Any trade involving the use of the square.

81. BUTTER

Any article of food; any meal.
Any article of table linen, china, or silver; any cooking utensil.
Any process of cooking.

82. DOCTOR

The name of any physician.
Any medical specialty or practice.
Any medical or surgical procedure.
Any therapeutic remedy or method.
Any organization for the treatment of disease.
Name of any injury or disease.

83. LOUD

Any sound or sound quality.
Any part of the human vocal apparatus.
Any act of vocalization.
Any musical instrument.
Any apparatus for making sound signals.
Word denoting renown or commendation.

84. THIEF

Word denoting crime or wrongdoing.
Word denoting any circumstance propitious for theft.
Any common measure for the prevention or punishment of crime.
Any judicial, police, or penal authority.
Any readily portable article of value.
Word denoting renown.

85. LION

Word denoting or implying fear.
Any animal.

86. JOY

Word denoting a state, quality, faculty, or function of the mind.
Any common manifestation of emotion.
Any occasion, act, or means of recreation or of pleasurable excitement.

87. BED

Any article of bedding, bed linen, or night-clothes.
Any article of furniture.
Any living room, apartment, or building.
Any part of a room.
Any division of the diurnal cycle.
Any material of which beds are made.
Word pertaining to sleep or rest.

88. HEAVY

Word denoting or implying weight or lightness.
Any object or substance which characteristically possesses the quality of either great weight or marked lightness.
Any means of support or suspension.
Any fabric; any article of clothing or bedding.
Word denoting something to be carried or transferred.
Any painful emotion.
Word denoting a state of lowered consciousness.

89. TOBACCO

The name of any brand or variety of tobacco.
Term denoting any common quality of tobacco.
Any physiological or pathological effect of tobacco.
Any word which expresses subjective characterization of tobacco.

90. BABY

Word denoting or implying age or size of a person.
Word pertaining to familial relationships or domestic organization.
Name of any person.
Any part of a person's body.
Any article of a child's apparel.
Any common child's toy or game.
Word pertaining to any custom or ceremony connected with the birth or rearing of children.
Any term of obstetrics.

91. MOON

Any term of astronomy.
Word denoting or implying illumination or obscuration of light.
Any division of the diurnal cycle.

92. SCISSORS

Any operation or handicraft involving the use of scissors.
Any fabric; any article of clothing.
Any metal of which scissors are made.
Any tool for cutting, piercing, or sharpening.
Any operation of cutting, piercing, or sharpening.

93. QUIET

Any place where silence usually prevails or is enforced.
Word denoting or implying a state of lowered psychical activity or of psychical inhibition.
Word denoting heightened psychical activity.
Any word pertaining to the emotions.

94. GREEN

Word which may be used to express subjective characterization of the green color.
Any object or substance which is always or often green in color.
Anything which is by convention or common usage connected with the green color.
Any color or coloring material.

Any plant, collection of plants, or part of a plant.
Any word clearly related to the word Green used as a proper name.

95. SALT

Any article of food that is usually seasoned with salt; any seasoning; any relish.
Any article of table linen, china, or silver.
Any process of cooking.
Any term of chemistry.

96. STREET

Name of any street or city.
Any part of a street.
Any building.
Any manner or means of locomotion commonly employed in traveling through streets.

97. KING

Any name of the Deity.
The proper or common name of any ruler of a nation or of a smaller municipality.
Any nation or country.
Any title of nobility.
Any word clearly related to the word King used as a proper name.

98. CHEESE

Any article of food; any meal.
Word denoting any variety of cheese.
Word pertaining to taste, flavor, or odor.
Word pertaining to appetite.
Any article of table linen, china, or silver.

99. BLOSSOM

Any plant, collection of plants, or part of a plant.
Any term of botany.
Any division of the annual cycle.

100. AFRAID

Any affective state; any common demonstration of emotion.
Any common object of fear.
Word denoting or implying danger, courage; any means of defense or protection against danger.

APPENDIX VII

STANDARD PSYCHOLOGICAL GROUP TESTS

The following tests can be applied not only to individual subjects, but also to groups of subjects. They can be best conducted in a classroom containing the usual equipment of desks, blackboards, etc.

Tests 1 and 2 require no materials other than writing materials for each subject. The materials required for tests 3 to 7 consist in printed forms which may be purchased in packages of 25 from The Morningside Press, 417 West 118th Street, New York.

The following table gives the age norms for each test established by application to large numbers of subjects:

TABLE 21

	Ages in Years.						
	6	7	8	9	10	11	12
1. Digit span, 1 of 3	4	5	5	5	6	6	6
2. Logical memory, points	3	17	25	31	34	38	41
3. Cancelling A, in 1 minute	16	23	27	30	35	38	42
4. Completion, Trabue A	0	4	8	12	16	20	24
5. Opposites, in 1 minute	0	2	7	8	9	10	12
6. Part-whole, in 1 minute	0	0	5	6	8	9	10
7. Word building, in 5 minutes	0	1	4	5	6	8	9

	Ages in Years.					
	13	14	15	16	17	18
1. Digit span, 1 of 3	6	7	7	7	7	8
2. Logical memory, points	43	44	44	45	45	50
3. Cancelling A, in 1 minute	48	50	54	57	59	60
4. Completion, Trabue A	28	32	36	40	44	48
5. Opposites, in 1 minute	14	15	16	17	19	20
6. Part-whole, in 1 minute	11	12	15	16	18	19
7. Word building, in 5 minutes	11	12	13	14	16	18

Test 1. Digit Span.—Instructions.—"*Now I am going to say some easy numbers. Listen to them carefully, and when I am through I want you to write them down in the same order as given.*" Illustrate by a simple example. Then take in sequence the following groups of digits, calling them clearly, at the standard rate of one per second:

Set A	Set B	Set C
641	352	837
4739	2854	7261
42835	31759	98176
374859	521746	417925
9728475	2813439	4162593
72534896	49853762	95423718
438923517	981725436	629471583

Scoring.—The score is the largest number of digits a subject can repeat, once out of three different trials, as above.

Test 2. Logical Memory.—Instructions.—"*Now I am going to see how well you can remember things. I shall read some words to you, several in a group. When I have finished, try to write them down in* **exactly the same order** *that I gave them. If you cannot remember some of the words, make a mark where each of them goes, and put in the proper places all the other words you can remember.*" Read the words clearly, not more rapidly than one per second. Use the following:

A—street, ink, lamp.

B—spoon, horse, chair, stone.

C—ground, clock, boy, chalk, book.

D—desk, milk, hand, card, floor, cat.

E—ball, cup, glass, hat, fork, pole, cloud.

F—coat, girl, house, salt, glove, watch, box, mat.

Scoring.—A credit of 2 points is allowed for each correct word in the right position, 1 point being allowed for a correct word not in the right position. There are 33 words, hence the maximum score is 66 points. Credit any word that resembles closely in sound the correct word (thus

"cut" for "cup," "mill" for "milk"). Disregard spelling.

Test 3. Cancellation.—Instructions.—Put the paper before the subject with the printed side down. Say: "*When you turn the paper over you will find a lot of letters, all mixed up. You must draw a line like this* (illustrate) *through every A that you can find. Mark out every A, but do nothing to the other letters. I want to see how many A's you can mark out in one minute. Do you understand? All ready, go.*"

Scoring.—The score is the number of A's cancelled in one minute. Ignore errors, both omissions and cancellations of wrong letters.

Test 4. Completion.—Instructions.—"*See what it says at the top of the page. On each blank write the word which makes the best meaning. Only one word on each blank. Wherever there is a blank some word has been left out. You are to write the word in each place so that there will be a good meaning.* (Illustrate, using the sentence "See the ——— dog.") *Where there are two blanks you must use two words. Do as many of them as you can. You have twenty minutes for this.*"

Scoring.—Grade each sentence 2, 1 or 0, giving 2 for a perfect meaning, 1 for an inferior but acceptable meaning, and 0 for failure or incompleteness or meaninglessness. Ignore spelling. The score is the total number of points.

Test 5. Opposites.—Instructions.—"*When you turn the paper over you will find on the other side a list of words, with an empty space for you to write something beside each word. You are to write beside each word the word that means just the opposite of that word. If the first word is "long" what will you write? If the next word is "up" what will you write? Now do you understand? If you can't think of a word right away, just go on to the next. I want to see how many you can do in* **one minute**. *All ready, go.*" The words on the standard list are as follows: good, outside, quick, tall, big, loud,

white, light, happy, false, like, rich, sick, glad, thin, empty, war, many, above, friend.

Scoring.—The score is the number of correct opposites, giving credit for every word that could by any possible means be considered an opposite of a test word, except that adverbs or nouns are not credited for adjectives, nor adjectives for nouns.

Test 6. Part-Whole.—Instructions.—"*When you turn the paper over you will find twenty words, each of which names a* **part** *of something. You are to write after each word some word that means the* **whole** *of the thing. For example, if one word were " wheel " you could write " engine," because a wheel is a part of an engine. Or if one word were " toe " you could write " foot " because a toe is a part of a foot. All ready, go.*"

Scoring.—The score is the number of correct responses given in *one minute*. The words are: window, leaf, pillow, button, nose, smokestack, cog-wheel, cover, letter, petal, page, cob, axle, lever, blade, sail, coach, cylinder, beak, stamen.

Test 7. Word Building.—Instructions.—"*You see these letters? A–E–I–R–L–P. You can make words out of these letters. For example you can say E–A–R, " ear " and that is a word. But could you say R–A–T " rat "? No, because there is no T there. Could you say P–I–L–L, " pill "? No, because there is only one L there. So you must make as many words as you can from just these letters. Do not use any letters that are not there. Do not use any letter more than once in the same word. Do you understand? Now I am going to let you have* **five minutes**, *and I want to see how many words you can make. Write them all on the paper. Ready, go.*"

Scoring.—The score is the number of words correct (and correctly spelled) excluding obsolete and foreign words, and abbreviations. About 60 words are possible.

APPENDIX VIII

CLASSIFICATION OF MENTAL DISEASES ADOPTED BY THE AMERICAN MEDICO-PSYCHOLOGICAL ASSOCIATION MAY 30, 1917, AND BY THE NEW YORK STATE HOSPITAL COMMISSION JULY 1, 1917 [1]

1. Traumatic psychoses.
- (*a*) Traumatic delirium.
- (*b*) Traumatic constitution.
- (*c*) Post-traumatic mental enfeeblement.

2. Senile Psychoses.
- (*a*) Simple deterioration.
- (*b*) Presbyophrenic type.
- (*c*) Delirious and confused states.
- (*d*) Depressed and agitated states in addition to deterioration.
- (*e*) Paranoid states.
- (*f*) Pre-senile types.

3. Psychoses with Cerebral Arteriosclerosis.—(This includes psychoses following cerebral softenings or hemorrhage if due to arterial disease.)

4. General paralysis.
- (*a*) Tabetic type.
- (*b*) Cerebral type.

5. Psychoses with Cerebral Syphilis.

6. Psychoses with Huntington's Chorea.

7. Psychoses with Brain Tumor.

[1] Reprinted by permission from the *Statistical Guide* of the New York State Hospital Commission, fourth edition, Utica, 1918.

8. Psychoses with other Brain or Nervous Diseases.—(The following are the more frequent of these diseases and should be specified in the diagnosis):

Cerebral embolism.
Paralysis agitans.
Meningitis, tubercular or other forms (to be specified).
Multiple sclerosis.
Tabes.
Acute chorea.
Other conditions (to be specified).

9. Alcoholic Psychoses.

(*a*) Pathological intoxication.
(*b*) Delirium tremens.
(*c*) Korsakow psychoses.
(*d*) Acute hallucinosis.
(*e*) Chronic hallucinosis.
(*f*) Acute paranoid type.
(*g*) Chronic paranoid type.
(*h*) Alcoholic deterioration.
(*i*) Other types, acute or chronic.

10. Psychoses Due to Drugs and other Exogenous Toxins.

(*a*) Opium (and derivatives), cocaine, bromides, chloral, etc., alone or combined (to be specified).
(*b*) Metals, as lead, arsenic, etc. (to be specified).
(*c*) Gases (to be specified).
(*d*) Other exogenous toxins (to be specified).

11. Psychoses with Pellagra.

12. Psychoses with other Somatic Diseases.

(*a*) Delirium with infectious disease (specify).
(*b*) Post-infectious psychosis.
(*c*) Exhaustion-delirium.
(*d*) Delirium of unknown origin.
(*e*) Cardio-renal diseases.
(*f*) Diseases of the ductless glands.
(*g*) Other diseases or conditions (to be specified).

13. Manic-Depressive Psychoses.
- (*a*) Manic type.
- (*b*) Depressive type.
- (*c*) Stupor.
- (*d*) Mixed type.
- (*e*) Circular type.

14. Involution Melancholia.

15. Dementia Præcox.
- (*a*) Paranoid type.
- (*b*) Catatonic type.
- (*c*) Hebephrenic type.
- (*d*) Simple type.

16. Paranoia or Paranoic Conditions.

17. Epileptic Psychoses.
- (*a*) Deterioration.
- (*b*) Clouded states.
- (*c*) Other conditions (to be specified).

18. Psychoneuroses and Neuroses.
- (*a*) Hysterical type.
- (*b*) Psychasthenic type.
- (*c*) Neurasthenic type.
- (*d*) Anxiety neuroses.

19. Psychoses with Constitutional Psychopathic Inferiority.

20. Psychoses with Mental Deficiency.

21. Undiagnosed Psychoses.

22. Not Insane.
- (*a*) Epilepsy without psychosis.
- (*b*) Alcoholism without psychosis.
- (*c*) Drug addiction without psychosis.
- (*d*) Constitutional psychopathic inferiority without psychosis.
- (*e*) Mental deficiency without psychosis.
- (*f*) Others (to be specified).

Definitions and Explanatory Notes

The definitions and explanatory notes accompanying the classification were prepared by Dr. George H. Kirby, Director of the Psychiatric Institute, Ward's Island, N. Y.

1. Traumatic Psychoses.—The diagnosis should be restricted to those mental disorders arising as a direct or obvious consequence of brain (or head) injury which produces psychotic symptoms of a fairly characteristic kind. The amount of damage to the brain may vary from an extensive destruction of tissue to simple concussion or physical shock with or without fracture of the skull.

Manic-depressive psychosis, general paralysis, dementia præcox, and other mental disorders in which trauma may act as a contributory or precipitating cause, should **not** be included in this group.

The following are the most common clinical types of traumatic psychosis and should be specified in the statistical report:

(*a*) Traumatic delirium: This may take the form of an acute delirium (concussion delirium), or a more protracted delirium resembling the Korsakow mental complex.

(*b*) Traumatic constitution: Characterized by a gradual post-traumatic change in disposition, with vasomotor instability, headaches, fatigability, irritability or explosive emotional reactions; usually hyper-sensitiveness to alcohol, and in some cases development of paranoid, hysteroid or epileptoid symptoms.

(*c*) Post-traumatic mental enfeeblement (dementia): Varying degrees of mental reduction with or without aphasic symptoms, epileptiform attacks or development of a cerebral arteriosclerosis.

2. Senile Psychoses.—A well-defined type of psychosis which as a rule develops gradually and is characterized by the following symptoms:

Impairment of retention (forgetfulness) and general failure of memory more marked for recent experiences; defects in orientation and a general reduction of mental capacity: the attention, concentration and thinking processes are interfered with; there is self-centering of interests, often irritability and stubborn opposition; a tendency to reminiscence and fabrication. Accompanying this deterioration there may occur paranoid trends, depressions, confused states, etc. Certain clinical types should therefore be specified, but these often overlap:

(*a*) Simple deterioration: Retention and memory defects, reduction in intellectual capacity and narrowing of interests; usually also suspiciousness, irritability and restlessness, the latter particularly at night.

(*b*) Presbyophrenic type: Severe memory and retention defects with complete disorientation; but at the same time preservation of

mental alertness and attentiveness with ability to grasp immediate impressions and conversation quite well. Forgetfulness leads to absurd contradictions and repetitions; suggestibility and free fabrication are prominent symptoms. (The general picture resembles the Korsakow mental complex.)

(*c*) Delirious and confused types: Often in the early stages of the psychosis and for a long period the picture is one of deep confusion or a delirious condition.

(*d*) Depressed and agitated types: In addition to the underlying deterioration there may be a pronounced depression and persistent agitation.

(*e*) Paranoid types: Well-marked delusional trends, chiefly persecutory or expansive ideas, often accompany the deterioration and in the early stages may make the diagnosis difficult if the defect symptoms are mild.

(*f*) Pre-senile types: The so-called "Alzheimer's disease"; an early senile deterioration which usually leads rapidly to a deep dementia. Reported to occur as early as the fortieth year. Most cases show an irritable or anxious depressive mood with aphasic or apractic symptoms. There is apt to be general resistiveness and sometimes spasticity.

3. Psychoses with Cerebral Arteriosclerosis.—The clinical symptoms, both mental and physical, are varied, depending in the first place on the distribution and severity of the vascular cerebral disease and probably to some extent on the mental make-up of the person.

Cerebral physical symptoms, headaches, dizziness, fainting attacks, etc., are nearly always present and usually signs of focal brain disease appear sooner or later (aphasia, paralysis, etc.).

The most important mental symptoms (particularly if the arteriosclerotic disease is diffuse) are impairment of mental tension, i.e., interference with the capacity to think quickly and accurately, to concentrate and to fix the attention; fatigability and lack of emotional control (alternate weeping and laughing). Often a tendency to irritability is marked; the retention is impaired and with it there is more or less general defect of memory, especially in the advanced stages of the disease, or after some large destructive lesion occurs.

Pronounced psychotic symptoms may appear in the form of depression (often of the anxious type), suspicions or paranoid ideas, or episodes marked by confusion.

To be included in this group are the psychoses following cerebral softening or hemorrhage if due to arterial disease. (Autopsies in state hospitals show that in arteriosclerotic cases softening is relatively much more frequent than hemorrhage.)

Differentiation from senile psychosis is sometimes difficult, particularly if the arteriosclerotic disease manifests itself in the senile

period. The two conditions may be associated; when this happens preference should be given in the statistical report to the arteriosclerotic disorder.

High blood pressure, although usually present, is not essential for the diagnosis of cerebral arteriosclerosis.

4. General Paralysis.—The range of symptoms encountered in general paralysis is too great to be reviewed here in detail. As to mental symptoms, most stress should be laid on the early changes in disposition and character, judgment defects, difficulty about time relations and discrepancies in statements, forgetfulness and later on a diffuse memory impairment. Cases with marked grandiose trends are less likely to be overlooked than cases with depressions, paranoid ideas, alcoholic-like episodes, etc.

Mistakes of diagnosis are most apt to be made in those cases having in the early stages pronounced psychotic symptoms and relatively slight defect symptoms, or cases with few definite physical signs. Lumbar puncture should always be made if there is any doubt about the diagnosis. A Wassermann examination of the blood alone is not sufficient, as this does not tell us whether or not the central nervous system is involved.

From the neurological standpoint two types may be differentiated:

(*a*) Cerebral form (with increased knee jerks).

(*b*) Tabetic form (diminished or absent knee jerks).

5. Psychoses with Cerebral Syphilis.—Since general paralysis itself is now known to be a parenchymatous form of brain syphilis, the differentiation of the cerebral syphilis cases might on theoretical grounds be regarded as less important than formerly. Practically, however, the separation of the non-parenchymatous forms is very important because the symptoms, the course and therapeutic outlook in most of these cases are different from those of general paralysis.

According to the predominant pathological characteristics, three types of cerebral syphilis may be distinguished, viz.: (*a*) Meningitic, (*b*) endarteritic, (*c*) gummatous. The lines of demarcation between these types are not, however, sharp ones. We practically always find in the endarteritic and gummatous types a certain amount of meningitis.

The acute meningitic form is the most frequent type of cerebral syphilis and gives little trouble in diagnosis; many of these cases do not reach state hospitals. In most cases after prodromal symptoms (headache, dizziness, etc.) there is a rapid development of physical signs, usually cranial nerve involvement, and a mental picture of dullness or confusion with few psychotic symptoms except those related to a delirious or organic reaction.

In the rarer chronic meningitic forms which are apt to occur a long

time after the syphilitic infection, usually in the period in which we might expect general paralysis, the diagnostic difficulties may be considerable.

In the endarteritic forms the most characteristic symptoms are those resulting from focal vascular lesions.

In the gummatous forms the slowly developing focal and pressure symptoms are most significant.

In all forms of cerebral syphilis the psychotic manifestations are less prominent than in general paralysis and the personality is much better preserved as shown by the social reactions, ethical sense, judgment and general behavior. The grandiose ideas and absurd trends of the general paralytic are rarely encountered in these cases.

6. Psychoses with Huntington's Chorea.—Mental symptoms are a constant accompaniment of this form of chorea and as a rule become more marked as the disease advances. Although the disease is regarded as being hereditary in nature, a diagnosis can be made on the clinical picture in the absence of a family history.

The chief mental symptoms are those of an emotional change, either apathy, mental inertia and silliness or a depressive irritable reaction with a tendency to passionate outbursts. As the disease progresses the memory is affected to some extent, but the patient's ability to recall past events is often found to be surprisingly well preserved when the disinclination to co-operate and give information can be overcome. Likewise the orientation is well retained even when the patient appears very apathetic and listless. Suspicions and paranoid ideas are prominent in some cases.

7. Psychoses with Brain Tumor.—A large majority of brain tumor cases show definite mental symptoms. Most frequent are mental dullness, somnolence, hebetude, slowness in thinking, memory failure, irritability and depression, although a tendency to facetiousness is sometimes observed. Episodes of confusion with hallucinations are common; some cases express suspicions and paranoid ideas.

The diagnosis must rest in most cases on the neurological symptoms, and these will depend on the location, size and rate of growth of the tumor. Certain general physical symptoms due to an increased intracranial pressure are present in most cases, viz.: headache, dizziness, vomiting, slowing of the pulse, choked disc and interlacing of the color fields.

8. Psychoses with Other Brain or Nervous Diseases.—This division provides a place for grouping a variety of less common mental disorders associated with organic disease of the nervous system and not included in the preceding larger groups. On the card the special type of nervous disease should be mentioned after the group name. The following are the conditions most frequently met with:

(*a*) Cerebral embolism (if an incident in cerebral arteriosclerosis it should be placed in group 3).

(*b*) Paralysis agitans.

(*c*) Meningitis, tubercular or other forms to be specified.

(*d*) Multiple sclerosis.

(*e*) Tabes (paresis to be carefully excluded).

(*f*) Acute chorea (Sydenham's type). Hysterical chorea to be excluded.

(*g*) Other conditions (to be specified).

9. Alcoholic Psychoses.—The diagnosis of alcoholic psychosis should be restricted to those mental disorders arising with few exceptions in connection with chronic drinking and presenting fairly well-defined symptom-pictures. We must guard against making the alcoholic group too inclusive. Over-indulgence in alcohol is often found to be merely a symptom of another psychosis, or at any rate may be incidental to another psychosis, such as general paralysis, manic-depressive insanity, dementia præcox, epilepsy, etc. The cases to be regarded as alcoholic psychoses and which do not result from chronic drinking are the episodic attacks in some psychopathic personalities, the dipsomanias (the true periodic drinkers) and pathological intoxication, any one of which may develop as the result of a single imbibition or a relatively short spree.

The following alcoholic reactions usually present symptoms distinctive enough to allow of clinical differentiation:

(*a*) Pathological intoxication: An unusual or abnormal immediate reaction to taking a large or small amount of alcohol. Essentially an acute mental disturbance of short duration characterized usually by an excitement or furor with confusion and hallucinations, followed by amnesia.

(*b*) Delirium tremens: A hallucinatory delirium with marked general tremor and toxic symptoms.

(*c*) Korsakow's disease: This occurs with or without polyneuritis. The delirious types are not readily differentiated in the early stages from severe delirium tremens but are more protracted. The non-delirious type presents a characteristic retention defect with disorientation, fabrication, suggestibility and tendency to misidentify persons. Hallucinations are infrequent after the acute phase.

(*d*) Acute hallucinosis: This is chiefly an auditory hallucinosis of rapid development with clearness of the sensorium, marked fears, and a more or less systematized persecutory trend.

(*e*) Chronic hallucinosis: This is an infrequent type which may be regarded as the persistence of the symptoms of the acute hallucinosis without change in the character of the symptoms except perhaps a gradual lessening of the emotional reaction accompanying the hallucinations.

(*f*) Acute paranoid type: Suspicions, misinterpretations, and persecutory ideas, often a jealous trend; hallucinations usually subordinate; clearing up on withdrawal of alcohol.

(*g*) Chronic paranoid type: Persistence of symptoms of the acute paranoid type with fixed delusions of persecution or jealousy usually not influenced by withdrawal of alcohol; difficult to differentiate from non-alcoholic paranoid states or dementia præcox.

(*h*) Alcoholic deterioration: A slowly developing moral, volitional and emotional change in the chronic drinker; apparently relatively few cases are committed as the mental symptoms are not usually looked upon as sufficient to justify the diagnosis of a definite psychosis. The chief symptoms are ill humor and irascibility or a jovial, careless, facetious mood; abusiveness to family, unreliability and tendency to prevarication; in some cases definite suspicions and jealousy; there is a general lessening of efficiency and capacity for physical and mental work; memory not seriously impaired. To be excluded are cases with residual defects due to Korsakow's disease, or with mental reduction due to arteriosclerosis or to traumatic lesions.

(*i*) Other types to be specified.

10. Psychoses Due to Drugs and Other Exogenous Toxins.—The clinical pictures produced by drugs and other exogenous poisons are principally deliria or states of confusion; although sometimes hallucinatory and paranoid reactions are met with. Certain poisons and gases apparently produce special symptoms, e.g., cocaine, lead, illuminating gas, etc. Grouped according to the toxic etiological factors the following are to be differentiated:

(*a*) Opium (and derivatives), cocaine, bromides, chloral, etc., alone or combined (to be specified).

(*b*) Metals, as arsenic, lead, etc. (to be specified).

(*c*) Gases (to be specified).

(*d*) Other exogenous toxins (to be specified).

11. Psychoses with Pellagra.—The relation which various mental disturbances bear to the disease pellagra is not yet settled. Cases of pellagra occurring during the course of a well-established mental disease such as dementia præcox, manic-depressive insanity, senile dementia, etc., should not be included in this group. The mental disturbances which are apparently most intimately connected with pellagra are certain delirious or confused states (toxic-organic-like reactions) arising during the course of a severe pellagra. These are the cases which for the present should be placed in the group of psychoses with pellagra. Symptoms of Meyer's central neuritis should be looked for in these cases.

12. Psychoses with Other Somatic Diseases.—Under this heading are brought together those mental disorders which appear to depend

directly on some physical disturbance or somatic disease not already provided for in the foregoing groups.

In the types designated below under (*a*) to (*e*) inclusive, we have essentially deliria or states of confusion arising during the course of an infectious disease or in association with a condition of exhaustion or a toxæmia. The mental disturbance is apparently the result of interference with brain nutrition or the unfavorable action of certain deleterious substances, poisons, or toxins, on the central nervous system. The clinical pictures met with are extremely varied. The delirium may be marked by severe motor excitement and incoherence of utterance, or by multiform hallucinations with deep confusion or a dazed, bewildered condition; epileptiform attacks, catatonic-like symptoms, stupor, etc., may occur. In classifying these psychoses a difficult problem arises in many cases if attempts are made to distinguish between infection and exhaustion as etiological factors. For statistical reports the following differentiations should be made:

Under (*a*) "Delirium with infectious disease," place the *initial deliria* which develop during the prodromal or incubation period or before the febrile stage as in some cases of typhoid, small-pox, malaria, etc.; the *febrile deliria* which seem to bear a definite relation to the rise in temperature; the *post-febrile deliria* of the period of defervescence including the so-called "collapse delirium."

Under (*b*) "Post-infectious psychosis" are to be grouped deliria and mild forms of mental confusion or the depressive, irritable, suspicious reactions which occur during the period of convalescence from infectious diseases. Physical asthenia and prostration are undoubtedly important factors in these conditions and differentiation from "exhaustion deliria" must depend chiefly on the history and the obvious close relationship to the preceding infectious disease. (Some cases which fail to recover show a peculiar mental enfeeblement.) In this group should be classed the "*cerebropothia psychica toxæmica*" or the non-alcoholic polyneuritic psychoses following an infectious disease as typhoid, influenza, septicæmia, etc.

Under (*c*) "Exhaustion delirium" are to be classed psychoses in which physical exhaustion, not associated with or the result of an infectious disease, is the chief precipitating cause of the mental disorder, e.g., hemorrhage, severe physical over-exertion, deprivation of food, prolonged insomnia, debility from wasting disease, etc.

Of the psychoses which occur with diseases of the ductless glands, the best known are the thyroigenous mental disorders. Disturbance of the pituitary or of the thymus function is often associated with mental symptoms.

According to the etiology and symptoms the following types should therefore be specified under "Psychoses with other Somatic Diseases":

(*a*) Delirium with infectious disease (specify).
(*b*) Post-infectious psychoses (specify)
(*c*) Exhaustion delirium.
(*d*) Delirium of unknown origin.
(*e*) Cardio-renal disease.
(*f*) Diseases of the ductless glands (specify).
(*g*) Other diseases or conditions (to be specified).

13. Manic-Depressive Psychoses.—This group comprises the essentially benign affective psychoses: mental disorders which fundamentally are marked by emotional oscillations and a tendency to recurrence. Various psychotic trends, delusions, illusions and hallucinations, clouded states, stupor, etc., may be added. To be distinguished are:

The manic reaction with its feeling of well-being (or irascibility), flight of ideas and over-activity.

The depressive reaction with its feeling of mental and physical insufficiency, a despondent, sad or hopeless mood and in severe depressions, retardation and inhibition; in some cases the mood is one of uneasiness and anxiety, accompanied by restlessness.

The mixed reaction, a combination of manic and depressive symptoms.

The stupor reaction with its marked reduction in activity, depression, ideas of death, and often dream-like hallucinations; sometimes mutism, drooling and muscular symptoms suggestive of the catatonic manifestations of dementia præcox, from which, however, these manic-depressive stupors are to be differentiated.

An attack is called circular when, as is often the case, one phase is followed immediately by another phase, e.g., a manic reaction passes over into a depressive reaction or vice versa.

Cases formerly classed as "Allied to Manic-depressive" should be placed here rather than in the "Undiagnosed" group.

In the statistical reports the following should be specified:

(*a*) Manic attack.
(*b*) Depressive attack.
(*c*) Stuporous attack.
(*d*) Mixed attack.
(*e*) Circular attack.

14. Involution Melancholia.—These depressions are probably related to the manic-depressive group; nevertheless the symptoms and the course of the involution cases are sufficiently characteristic to justify us in keeping them apart as special forms of the emotional reaction.

To be included here are the slowly developing depressions of *middle life and later years* which come on with worry, insomnia, uneasiness

anxiety and agitation, showing usually the unreality and sensory complex, but little or no evidence of any difficulty in thinking. The tendency is for the course to be a prolonged one. Arteriosclerotic depressions should be excluded.

When agitated depressions of the involution period are clearly superimposed on a manic-depressive foundation with previous attack (depression or excitement) they should, for statistical purposes, be classed in the manic-depressive group.

15. Dementia Præcox.—This group cannot be satisfactorily defined at the present time, as there are still too many points at issue as to what constitute the essential clinical features of dementia præcox. A large majority of the cases which should go into this group may, however, be recognized without special difficulty, although there is an important smaller group of doubtful, atypical, allied or transitional cases which from the standpoint of symptoms or prognosis occupy an uncertain clinical position.

The term "schizophrenia" is now used by many writers instead of dementia præcox. Cases formerly classed as "Allied to Dementia Præcox" should be placed here rather than in the "Undiagnosed" group.

The following mentioned features are sufficiently well established to be considered most characteristic of the dementia præcox type of reaction:

A seclusive type of personality or one showing other evidences of abnormality in the development of the instincts and feelings.

Appearance of defects of interests and discrepancies between thought on the one hand and the behavior-emotional reactions on the other.

A gradual blunting of the emotions, growing indifference or silliness with serious defects of judgment and often hypochondriacal complaints, suspicions or ideas of reference.

Development of peculiar trends, often fantastic ideas, with odd, impulsive or negativistic conduct not accounted for by any acute emotional disturbance or impairment of the sensorium.

Appearance of autistic thinking and dream-like ideas, peculiar feelings of being forced, of interference with the mind, of physical or mystical influences, but with retention of clearness in other fields (orientation, memory, etc.).

According to the prominence of certain symptoms in individual cases the following four clinical forms of dementia præcox may be specified, but it should be borne in mind that these are only relative distinctions and that transitions from one clinical form to another are common:

(*a*) Paranoid type: Cases characterized by a prominence of delu-

sions, particularly ideas of persecution or grandeur, often connectedly elaborated, with hallucinations in various fields.

(*b*) Catatonic type: Cases in which there is a prominence of negativistic reactions or various peculiarities of conduct with phases of stupor or excitement, the latter characterized by impulsive, queer or stereotyped behavior and usually hallucinations.

(*c*) Hebephrenic type: Cases showing prominently a tendency to silliness, smiling and laughing, grimacing, mannerisms in speech and action, and numerous peculiar ideas usually absurd, grotesque and changeable in form.

(*d*) Simple type: Cases characterized by defects of interest, gradual development of an apathetic state, often with peculiar behavior, but without expression of delusions or hallucinations.

16. Paranoia and Paranoic Conditions.—From this group should be excluded the deteriorating paranoic states and paranoic states symptomatic of other mental disorders or of some damaging factor such as alcohol, organic brain disease, etc.

The group comprises cases which show clinically fixed suspicions, persecutory delusions, dominant ideas or grandiose trends logically elaborated and with due regard for reality after once a false interpretation or premise has been accepted. Further characteristics are formally correct conduct, adequate emotional reactions, clearness and coherence of the train of thought.

17. Epileptic Psychoses.—In addition to the epileptic deterioration transitory psychoses may occur which are usually characterized by a clouded mental state followed by an amnesia for external occurrences during the attack. (The hallucinatory and dream-like experiences of the patient during the attack may be vividly recalled.) Various automatic and secondary states of consciousness may occur.

According to the most prominent clinical features the epileptic mental disorders should therefore be specified as follows:

(*a*) Deterioration: A gradual development of mental dullness, slowness of association and thinking, impairment of memory, irritability or apathy.

(*b*) Clouded states. Usually in the form of dazed reactions with deep confusion, bewilderment and anxiety or excitements with hallucinations, fears and violent outbreaks; instead of fear there may be ecstatic moods with religious exaltation.

(*c*) Other conditions. (To be specified.)

18. Psychoneuroses and Neuroses.—The psychoneurosis group includes those disorders in which mental forces or ideas of which the subject is either aware (conscious) or unaware (subconscious) bring about various mental and physical symptoms—in other words these disorders are essentially psychogenic in nature.

The term "neurosis" is now generally used synonymously with psychoneurosis, although it has been applied to certain disorders in which, while the symptoms are both mental and physical, the primary cause is thought to be essentially physical. In most instances, however, both psychogenic and physical causes are operative and we can assign only a relative weight to the one or the other.

The following types are sufficiently well defined clinically to be specified:

(*a*) *Hysterical type:* Episodic mental attacks in the form of delirium, stupor or dream states during which repressed wishes, mental conflicts or emotional experiences detached from ordinary consciousness break through and temporarily dominate the mind. The attack is followed by partial or complete amnesia. Various physical disturbances (sensory and motor) occur in hysteria, and these represent a conversion of the affect of the repressed disturbing complexes into bodily symptoms or, according to another formulation, there is a dissociation of consciousness regarding some physical function.

(*b*) *Psychasthenic type:* This includes also the compulsive and obsessional neuroses of some writers. The main clinical characteristics are phobias, obsessions, morbid doubts and impulsions, feelings of insufficiency, nervous tension and anxiety. Episodes of marked depression and agitation may occur. There is no disturbance of consciousness or amnesia as in hysteria.

(*c*) *Neurasthenic type:* This should designate the fatigue neuroses in which physical as well as mental causes evidently figure; characterized essentially by mental and motor fatigability and irritability; also various hyperæsthesias, paræsthesias, hypochondriasis and varying degrees of depression.

(*d*) *Anxiety neuroses:* A clinical type in which morbid anxiety or fear is the most prominent feature. A general nervous irritability (or excitability) is regularly associated with the anxious expectation or dread; in addition there are numerous physical symptoms which may be regarded as the bodily accompaniments of fear, particularly cardiac and vasomotor disturbances: the heart's action is increased, often there is irregularity and palpitation; there may be sweating, nausea, vomiting, diarrhœa, suffocative feelings, dizziness, trembling, shaking, difficulty in locomotion, etc. Fluctuations occur in the intensity of the symptoms, the acute exacerbations constituting the "anxiety attack."

19. Psychoses with Constitutional Psychopathic Inferiority.—Under the designation of constitutional psychopathic inferiority is brought together a large group of pathological personalities whose abnormality of make-up is expressed mainly in the character and intensity of their emotional and volitional reactions. Individuals with

an intellectual defect (feeblemindedness) are not to be included in this group.

Several of the preceding groups, in fact all of the so-called constitutional psychoses, manic-depressive, dementia præcox, paranoia, psychoneuroses, etc., may be considered as arising on a basis of psychopathic inferiority because the previous mental make-up in these conditions shows more or less clearly abnormalities in the emotional and volitional spheres. These reactions are apparently related to special forms of psychopathic make-up now fairly well differentiated, and the associated psychoses also have their own distinctive features.

There remain, however, various other less well-differentiated types of psychopathic personalities, and in these the psychotic reactions (psychoses) also differ from those already specified in the preceding groups.

It is these less well-differentiated types of emotional and volitional deviation which are to be designated, at least for statistical purposes, as constitutional psychopathic inferiority. The type of behavior disorder, the social reactions, the trends of interests, etc., which the psychopathic inferior shows give special features to many cases, e.g., criminal traits, moral deficiency, tramp life, sexual perversions and various temperamental peculiarities.

The pronounced mental disturbances or psychoses which develop in psychopathic inferiors and bring about their commitment are varied in their clinical form and are usually of an episodic character. Most frequent are attacks of irritability, excitement, depression, paranoid episodes, transient confused states, etc. True prison psychoses belong in this group.

In accordance with the standpoint developed above, a psychopathic inferior with a manic-depressive attack should be classed in the manic-depressive group, and likewise a psychopathic inferior with a schizophrenic psychosis would go into the dementia præcox group.

Psychopathic inferiors without an episodic mental attack or any psychotic symptoms should be placed in the "Not Insane" group under the appropriate sub-heading.

20. Psychoses with Mental Deficiency.—This group includes the various types of intellectual deficiency or feeblemindedness. The degree of mental deficiency should be determined by the history and the use of standard psychometric tests. The intellectual level may be denoted in the statistics by specifying moron, imbecile, idiot.

Acute, usually transient, psychoses of various forms occur in mentally deficient persons and commitment to a hospital for the insane may be necessary. The most common mental disturbances are episodes of excitement or irritability, depressions, paranoid trends, hallucinatory attacks, etc.

Mentally deficient persons may suffer from manic-depressive attacks or from dementia præcox. When this occurs the diagnostic grouping should be manic-depressive or dementia præcox as the case may be.

Mental deficiency cases without psychotic disturbances should go into the group of "Not Insane" under the appropriate sub-heading.

21. Undiagnosed Psychoses.—In this group should be included cases in which a satisfactory diagnosis cannot be made and the psychosis must therefore be regarded as an unclassified one. The difficulty may be due to lack of information or inaccessibility of the patient; or the clinical picture may be obscure, the etiology unknown, or the symptoms unusual. Cases placed in this group during the year should be again reviewed before the annual diagnostic tables are completed.

Cases of the type formerly placed in one of the allied groups should not be put in the undiagnosed group except for some special reason. Most of the cases hitherto called allied should be placed in the main group to which they seem most closely related.

22. Not Insane.—This group should receive the occasional case which after investigation and observation gives no evidence of having had a psychosis. The only difficulty likely to be encountered in the statistical reports will arise in the grouping of patients who have recovered from a psychosis prior to admission. In such cases, if the history, the commitment papers or the patient's retrospective account show that a psychosis actually existed immediately before admission, that is, at the time of commitment, then the case should be considered as having suffered from a mental disorder, and classification under the appropriate heading should be made.

If it is determined that no psychosis existed, then the condition which led to admission should be specified. The following come most frequently into consideration:

(*a*) Epilepsy without psychosis.
(*b*) Alcoholism without psychosis.
(*c*) Drug addiction without psychosis.
(*d*) Constitutional psychopathic inferiority without psychosis.
(*e*) Mental deficiency without psychosis.
(*f*) Other conditions (to be specified).

INDEX OF AUTHORS

Adler, H. M., 148.
Alzheimer, A., 261, 392, 405, 407, 443, 629.
Amsden, G. S., 79, 402.
Angiolella, D., 395.
Anglade, J., 392.
Antheaume, A., 341.
Arnaud, 48, 56, 319, 378, 385.
Aschaffenburg, G., 7, 90, 174, 260, 421.

Babinski, J., 302, 303, 310, 311, 338, 366, 382, 388, 441.
Baer, A., 176
Bailey, Pearce, 309.
Baillarger, J., 53, 108, 370.
Baillet, 376.
Balint, R., 444.
Ball, C. R., 22, 103.
Ballet, G., 262, 371, 392, 423, 427.
Barker, L. F., 148.
Basedow, 435.
Baumann, W., 433.
Bayle, 370.
Beaunis, H., 36.
Bechterew, W. v., 33.
Beers, C. W., 115.
Bergonié, I., 385.
Bernard, Claude, 63.
Bernstein, C., 204.
Berze, 260.
Besson, A., 207.
Betz, 440.
Binet, A., 88, 90, 91, 96, 169, 185, 199.
Binswanger, O., 302, 405, 409, 427.
Birnbaum, K., 11.
Bleuler, E., 139, 220, 260.
Bloch, A., 376.
Bonnat, 385.
Bordet, J., 461.
Bordoni-Uffreduzzi, 64.
Bouchard, C., 371, 423, 430.
Bourneville, M., 195, 435.
Bramwell, M., 52.
Brault, J., 430.
Breuer, 302.
Bridges, J. W., 96.
Brill, A. A., 10, 120, 121, 124, 125, 127, 138, 145, 301.
Briquet, 433.
Brissaud, E., 65, 371, 423, 429.
Brown, Mabel W., 311.
Browning, C. H., 396.
Bruce, A. N., 307.
Brush, N. H., 402, 455.
Busch, Max, 29.

Calmiel, J. L. F., 370.
Campbell, C. M., 149.
Campbell, H., 310.
Capeletti, 213.
Capgras, J., 292.
Capps, 378.
Carrier, 321.
Casamajor, L., 196.
Castin, P., 56.
Chambard, 358.
Chapin, F. S., 150.

Charcot, J. M., 36, 86, 301, 371, 395, 407, 423, 430.
Chaslin, P., 422.
Chénais, 234.
Christian, 379.
Church, A., 474.
Cololian, 38.
Corson, Caroline C., 301.
Cotard, J., 56.
Cotton, H. A., 402, 439.
Coulon, 371.
Cullerre, A., 428, 429.

Dagonet, H., 380.
Darwin, C., 63, 125.
Davenport, C. B., 2, 3, 77, 192, 212, 227, 285, 328, 329.
Debove, 36, 86, 106, 107.
Déjerine, J., 395.
Delarras, 265.
Delasiauve, 422.
Delaye, 370.
Delbrück, A., 47.
DeQuincey, T., 358.
Dercum, F. X., 113, 114, 214, 308.
Desvaux, 419.
Devaux, 437.
Dide, M., 234.
Dreyfus, G. L., 293, 298.
Dubois, Paul, 113, 117.
Dumas, G., 63, 64, 65, 67, 269.
Dunlap, C. B., 396.
Dupouy, R., 227.
Dupré, E., 388, 437.

Eastman, F. C., 547.
Elderton, Ethel M., 196.
Ellis, A. W. M., 402.
Erlenmeyer, 361.
Esmarch, 395.
Esquirol, J. E. D., 21.
Exner, S., 393.

Fagan, J. O., 179.
Falret, J., 249, 254, 370.
Farnarier, 29, 103.
Faure, M., 427.
Felton, 455, 457.
Féré, C., 205, 206, 207, 208, 331, 339.
Fernald, G. G., 523.
Fernald, W. E., 203, 204.
Ferrari, M., 103.
Fischer, 396.
Fiske, C. N., 178.
Fordyce, J. H., 365.
Fournier, A., 168, 178, 396.
Franz, S. I., 91.
Freud, S., 117, 121, 124, 125, 127, 128, 129, 131, 137, 138, 141, 145, 301, 302, 314, 315, 320, 323.
Frink, H. W., 145.
Froment, 302.
Fuchs, A., 452, 453, 454.
Fuhrmann, M., 81.
Fuller, S. C., 444.
Furbush, E. M., 212.

Garnier, C., 333.
Gaster, M., 227.
Gates, M. F., 178.
Gatian de Clérambault, 383.
Gaupp, R., 305.
Gengou, O., 461.
Georget, 422.
Glueck, B., 220, 310.
Goddard, H. H., 3, 185.
Gourin, 106, 107.
Gowers, W. R., 394, 405.
Graves, 435.
Gray, H., 407.
Grellière, 384.
Griesinger, W., 1, 22, 66, 103, 113, 292, 434.
Guislain, 103.

Hamilton, A. S., 328.
Hammers, 455.
Hardwick, Rose S., 96.
Harrison, L. W., 178.

Haslam, J., 370.
Healy, M. T., 221.
Healy, W., 221, 477, 523.
Hecker, 229.
Heilbronner, K., 54, 211.
Hellsten, 7.
Heron, D., 167.
Herz, M., 346, 347, 430.
Hinkle, Beatrice M., 137.
Hippocrates, 2.
Hitschmann, E., 145.
Hoch, August, 10, 79, 259, 285.
Höffding, 73.
Hollingworth, H. L., iii.
Huntington, G., 11, 78, 193, 327, 625, 631.

Jacob, 225.
Jacquin, 428.
Janet, P., 49, 301, 319.
Jarrett, Mary C., iii, 150.
Jelliffe, S. E., 113, 117, 120, 141, 196, 301.
Jendrassic, 81.
Jessen, 395.
Joffroy, A., 30, 34, 38, 85, 86, 227, 321, 341, 347, 362, 384, 388, 395.
Jolly, P., 256.
Jones, A. B., 309, 314.
Jones, E., 120, 125, 141, 145, 313, 391, 452, 459.
Jouet, 360.
Jung, C. G., 10, 90, 120, 137, 141, 145.

Kahlbaum, 29, 229.
Kaplan, D. M., 368, 391, 455, 459, 464.
Kaufmann, 307, 311.
Kellogg, T. H., 147.
Kent, Grace H., 90, 98, 547, 551, 552.
Kéraval, P., 52.
Kirby, G. H., 12, 194, 260, 350, 628.
Kirn, 29.
Kline, G. M., 149.
Klippel, M., 339, 346, 347, 371, 378, 385, 395, 419.
Klopp, H. I., 444.
Koeppen, M., 47, 416
Koester, W., 86.
Kohn, 289.
Korsakoff, 351, 626, 628, 629, 632, 633.
Kraepelin, E., 7, 67, 72, 90, 113, 159, 174, 229, 234, 248, 254, 255, 256, 260, 267, 281, 285, 286, 287, 289, 292, 293, 332, 339, 371, 396, 400, 412, 421, 428, 447.
Krafft-Ebing, R. v., 211, 223, 225, 380, 395, 400.
Krishaber, 36.
Kuerz, E., 7, 174.

Lambert, C. I., 396, 405, 439.
Lange, C., 63, 391, 452, 455.
Laquer, B., 176.
Lasègue, 342, 370.
Lavoit, 89, 449.
Leahy, S. R., 357.
Legay, 30.
Legrande du Saulle, 206, 389.
Léri, A., 304, 306.
Leroy, 262.
Levinstein, O., 361.
Liepmann, H., 30, 344.
Llewellyn, L. J., 309, 314.
Londe, P., 320.
Lopez, 419.
Lowell, F., 548.
Lueckerath, 351.
Lunier, 370.
Lust, F., 305.

Macdonald, C., 313.
Magnan, V., 103, 108, 206, 210, 226, 248, 254, 262, 265, 321, 370, 375, 399.
Mahaim, 393, 394.

Mairet, A., 370.
Manaud, 320.
Mann, 368, 391.
Marandon de Montyel, 53, 382.
Marchi, 439.
Marey, 64.
Mariani, C. E., 30.
Marie, P., 382.
Marinesco, G., 334.
Marshall, C. F., 168, 178.
Masselon, 230, 233.
Mayer, M., 7, 174.
Mayo, C. H., 436.
McClelland, 455.
McCrae, 301.
McKenzie, I., 396.
Mendel, E., 370.
Mendel, G., 3.
Mercklin, 105.
Merson, J., 213.
Meunier, R., 227.
Meyer, Adolf, 10, 153, 171, 256, 257, 259, 260, 416, 439, 440, 470, 633.
Meyerson, A., 260.
Meynert, T., 38.
Mignot, R., 376.
Miller, 455.
Minet, J., 89, 449.
Mitchell, Ida, 547.
Moebius, P. J., 301, 302, 396.
Moeli, 210.
Moll, Albert, 224.
Moore, Anne, 187.
Moore, A. S., 260.
Moore, J., 371, 396, 398, 459.
Morselli, 64.
Mott, F. W., 367.
Mueller, Johannes, 19, 23, 24, 38.
Muncey, E. B., 328.
Murphy, J. K., 178, 367.

Nageotte, I., 394.
Neilson, W. A., 150.
Neymann, C. A., iii, 402.
Nissl, 393, 427, 444.
Noguchi, H., 89, 391, 396, 398, 452, 459, 465.

Ogilvie, H. S., 402.
Ordway, Mabel, 213.
Ormca, A. d', 213.
Orr, Florence I., 3, 6, 255.
Orton, S. T., 261.
Osler, W., 301.
Otis, Margaret, 547.

Pal, 393.
Pandy, 89, 391, 452, 459.
Parchappe, 370.
Paton, S., 474.
Payne, C. R., 120, 145, 314.
Pearson, Karl, 196.
Perusini, G., 444.
Peterson, F., 10, 145, 314.
Petri, 462.
Pfister, 109
Pfister, O., 120, 314.
Pichon, 360.
Pick, 54, 56.
Pierracini, 37.
Pierret, 385.
Pilcz, A., 233.
Pitres, A., 320, 323.
Plaut, F., 196, 396.
Pochon, 103.
Pollock, H. M., 17, 212.
Pollock, L. J., 441.
Power, D'Arcy, 178, 367.
Preyer, 474.
Proos, 433.
Putnam, J. P., 147.

Rauschburg, P., 444.
Régis, E., 211, 320, 323, 448.
Reiss, E., 285.
Revington, G., 26.
Ribot, T., 45, 47, 75, 320.
Richet, 213.
Ritti, A., 379, 448.

Robertson, A., 366, 377, 388.
Rogues de Fursac, J., iii, 86, 357, 371.
Romberg, 81.
Rosanoff, A. J., iii, 3, 6, 10, 11, 15, 18, 90, 98, 148, 160, 165, 171, 173, 174, 185, 190, 213, 218, 255, 260, 261, 303, 396, 459, 547, 551, 552.
Rosanoff, Isabel R., 547.
Rosenthal, 452, 453, 454.
Ross, G. W., 391, 452, 459.
Roubinowitch, J., 262, 319.
Ruedin, E., 29, 255, 332.
Russell, W. L., 443.
Ryon, W. G., 329.
Ryther, Margherita, 213.

Sadras, 370.
Samt, 207, 210.
Sander, 60, 262.
Saury, H., 363.
Schneider, L., 7, 174.
Schüle, 65.
Schultze, Otto, 307.
Schwartz, 211.
Séglas, J., 31, 36, 37, 38, 53, 56, 57, 58, 86, 262, 296, 320, 422, 423.
Sérieux, P., 38, 103, 104, 233, 341, 370.
Serveaux, 65, 341, 378.
Sheehan, R., 310.
Shields, 434.
Sicard, J. A., 311.
Siebert, 38.
Simon, T., 88, 90, 91, 96, 199.
Simon, T. W., 260.
Singer, H. D., 441.
Sioli, 261.
Smith, A., 7, 174.
Snydacker, E. F., 399.
Sollier, P., 196, 362.
Somers, E. M., 439.
Sommer, R., 49, 81, 206.
Sophocles, 132.
Southard, E. E., 149, 150, 156, 261, 439.
Spaulding, Edith R., 150.
Steen, R. H., 11.
Stier, E., 227.
Stoddart, W. H. B., 238.
Stricker, 37.
Strong, E. K., Jr., 547.
Swalm, 368, 391.
Swift, H. F., 402.
Sydenham, 632.

Tambourini, A., 38.
Terman, L. M., 96, 198, 476.
Thivet, 31, 448.
Tiffany, W. J., 444.
Toulouse, E., 213.
Trabue, M. R., 621.
Trénel, M., 56.
Trèves, M., 384.
Tschisch, W., 237.
Tuczek, 393.
Turner, J., 439.

Uhland, 134.

Vallon, C., 38, 211, 225, 321, 322, 382.
Viallon, 107.
Vignaud, 370.
Vires, 370.
Voisin, A., 206, 370.

Wardner, D. M., 402.
Wassermann, A., 89, 178, 364, 367, 391, 396, 401, 411, 438, 451, 452, 460, 469, 630.
Weeks, D. F., 3, 212.
Weigandt, W., 267.
Weigert, C., 393.
Wells, F. L., 91, 138, 547.
Wernicke, C., 24, 31, 32, 33, 39, 40, 52, 53, 73, 74, 269, 270, 342, 344, 347, 379, 447.
Westphal, A., 233, 319.

Whipple, G. M., 91.
White, W. A., 113, 117, 182, 302.
Wiglesworth, J., 438.
Williams, F. E., 311.
Willis, T., 405, 407.
Wiseman, J. I., 396, 459.
Wizel, 103.
Woodrcw, H., 548.
Woodworth, R. S., 91, 547.
Worcester, W. L., 439.

Ycrkes, R. M., 96.
Young, H. H., 364.

Ziehen, T., 287.

INDEX OF SUBJECTS

Abortion, 10.
Aboulia, 41, 63, 66, 70, 73, 277, 278, 359, 422, 427, 431.
Abscess of the brain, 437, 438.
Absence, 42, 207.
Absent-mindedness, 328.
Absinthe, 337, 352.
Abstinence, 10, 170, 174, 175, 213, 289, 341, 342, 346, 347, 354, 412.
Abstinence, pledge of, 114.
Abstinence, symptoms of, 347, 356, 360, 361.
Absurdity, 352, 374, 414, 630, 631.
See also Delusions, absurd.
Abuse by husband, 11.
Accessibility of institutions, 15.
Acute hallucinosis, 7, 194, 252, 342, 348–350, 626, 632.
Addiction to drugs, *see* Drug addictions.
Admission of patients, 102.
Adult sexuality, 122.
Æsthetic morality, 316, 317.
Æsthetic sense, 122.
Affect, 120, 140, 301, 302, 638.
Affect, displacement of, 129, 135, 136.
Affect in dreams, 132, 137.
Affection, 140.
Affectivity, 25, 26, 28, 41, 55, 57, 58, 61–70, 74, 97, 182, 207, 219, 229, 230, 231, 232, 236, 239, 246, 248, 251, 255, 256, 268, 277, 286, 291, 335, 353, 359, 371, 373, 380, 425, 429, 435, 445, 447, 631, 632, 635.
After-care, 77, 117–119, 154.
Age, 1, 13, 14, 16, 17, 95, 98, 139, 248, 255, 262, 285, 290, 292, 328, 329, 331, 357, 368, 400, 411, 431, 441, 443, 474, 553, 621.
Age, chronological, 95.
Age, mental, 95, 197, 198, 480.
Aggressive tendencies, 349, 414.
Agitated melancholia, 292.
Agitation, 25, 66, 208, 281, 292, 295, 298, 299, 324, 333, 344, 348, 351, 352, 361, 411, 419, 426, 429, 430, 441, 625, 629, 636, 638.
Agoraphobia, 323.
Akoasms, 31.
Albuminuria, 294, 298, 345, 350, 361, 378, 385, 423, 430.
Alcohol, 2, 7, 9, 10, 14, 77, 79, 165, 169, 175, 211, 215, 216, 270, 289, 321, 347, 348, 355, 421, 637.
Alcoholic delusional states, 7, 38, 194, 260, 266, 336, 342, 350, 626, 633.
Alcoholic dementia, 7, 194, 336, 350, 443, 447, 448, 626, 633.
Alcoholic hallucinosis, *see* Acute hallucinosis.
Alcoholic psychoses, 7, 10, 12, 14, 15, 16, 30, 88, 108, 119, 159, 166, 192, 194, 363, 391, 626, 632.

Alcoholism, acute, 331–334.
Alcoholism, chronic, 7, 170, 172–177, 211, 252, 296, 303, 331, 333, 335–354, 394, 399, 443, 627, 632, 640.
 diagnosis, 338.
 episodic accidents, 342–354.
 etiology, 339–341.
 pathological anatomy, 338–339.
 physical symptoms, 337–338.
 prognosis, 338.
 prophylaxis, 174.
 psychic symptoms, 335.
 treatment, 341.
Alcoholism, parental, 195, 196.
Alienation, mental, xiv, 52.
Allied to dementia præcox psychoses, 100, 260, 636.
Allied to manic-depressive psychoses, 100, 260, 318, 319, 635.
Allopsychic orientation, *see* Orientation, allopsychic.
Almshouse, 78, 204, 212.
Alternating psychoses, 283, 288.
Altruism, 61.
Alzheimer's disease, 443, 629.
Amaurosis, 300, 309, 366, 383.
Ambition, 53, 216, 235.
Amblyopia, 309, 383.
Amboceptor, 460, 463–465.
American Medico-Psychological Association, 194, 625.
Ammonium sulphate test, Ross-Jones, 89, 391, 459.
Amnesia, 42–46, 208, 300, 333, 351, 352, 354, 374, 415, 416, 632, 637, 638.
 anterograde, 43, 46, 231, 335, 352, 372, 431, 444.
 course of, 44, 45, 335.
 general, 46.
 law of, 45, 335, 352, 373, 445.
 of conservation, 43, 44, 445.
 of fixation, 43, 44, 231, 352, 372, 415, 431, 444.
Amnesia of reproduction, 44, 46, 352, 359, 431.
 partial, 46.
 progressive, 44, 45, 46, 335.
 retrograde, 43, 44, 46, 231, 335, 352, 359, 373, 431, 445.
 retrogressive, 44.
 stationary, 44.
 varieties of, 46.
Amorous paranoiacs, 265.
Anæsthesia, 68, 108, 233, 300, 303, 307, 309, 344, 366, 382, 410, 411.
Analgesia, 309.
Anamnesis, *see* History taking.
Anatomical stigmata of degeneration, 197.
Anatomy, pathological, *see* Pathological anatomy.
Anemia, 91.
Aneurism, 399, 408, 410.
Anger, 25, 61, 67, 68, 205, 219, 231, 269, 336, 371, 374, 387, 389, 416, 445.
Ankle clonus, 81.
Anorexia, 234, 235, 277, 279, 292, 294, 338, 385, 422. *See also* Appetite.
Antagonism, automatic, 72.
Anterior cerebral artery, 409.
Anterograde amnesia, *see* Amnesia, anterograde.
Antibodies, 461.
Antigen, 461, 465–467.
Antisocial behavior, xiv, 78, 79, 200.
Anuria, 430.
Anxiety, 25, 41, 65, 66, 130, 131, 207, 208, 231, 243, 245, 278, 292, 294, 295, 296, 298, 319, 320, 323, 324, 325, 351, 361, 408, 435, 441, 447, 627, 629, 635, 636, 637, 638.
Anxiety neurosis, 627, 638.
Anxious melancholia, 292, 295, 296, 298.

Apathy, 81, 205, 239, 240, 473, 631, 637.
Aphasia, 46, 367, 385, 409, 418, 438, 447, 628, 629.
  examination for, 81, 90, 470–473.
  motor, 382, 409.
  sensory, 409.
Aphonia, 121, 300, 307, 309, 409.
Apoplectiform seizures, 337, 375, 379, 382, 383, 386, 390, 408, 410, 447.
Apoplexy, 385, 410, 412, 448.
Appendix to frequency tables, 603–620.
Apperception, 199.
Appetite, 64, 79, 80, 230, 271, 297, 318, 423, 446.
Apprehensiveness, 67, 82, 441.
Apraxia, 438, 473, 629.
Arabs, 13.
Arachnitis, chronic, 370.
Arcus senilis, 446.
Argumentativeness, 218.
Argyll-Robertson pupils, 366, 377, 388.
Arithmomania, 321.
Army neuro-psychiatric experiences, 8, 303–317.
Army post, 192.
Arrests of development, xiii, 6, 11, 77, 193, 195–214, 260, 327, 433. *See also* Feeble-mindedness *and* Mental deficiency.
  complications, 200.
  diagnosis, 201.
  early manifestations, 196.
  etiology, 195.
  prognosis, 202.
  symptoms, 197.
  treatment, 202.
Arsenical poisoning, 626, 633.
Arson, 187.
Arterial supply of the brain, 405, 406.
Arterio-capillary fibrosis, 408.
Arteriosclerosis, 399, 446, 633.
Arteriosclerosis, cerebral, *see* Cerebral arteriosclerosis.
Artistic activities, 124.
Assault, 32, 219, 247, 250, 273, 336.
Association of ideas, 20, 21, 48–54, 68, 69, 70, 85, 199, 229, 230, 231, 232, 252, 268, 277, 281, 286, 287, 293, 332, 359, 373, 374, 422, 431, 444, 475, 637.
  automatic, 49, 70, 287.
  voluntary, 49, 70, 287.
Association tests, 90, 97, 98, 141, 547–620.
Assonance, 50.
Astereognosis, 409.
Asthma, 78.
Asylums, 78, 186, 220.
Atavistic heredity, 2, 328.
Ataxia, 86, 388.
Atheroma, 338, 341, 385, 448.
Atony, muscular, 318.
Atrophy, brain, 261, 330, 391, 392, 407, 408, 410, 411, 448.
Atrophy, muscular, 300, 374, 384.
Atrophy, optic, 360, 383.
Attacks, previous, 80, 273.
Attention, 22, 28, 30, 49, 85, 141, 230, 231, 232, 268, 273, 291, 359, 373, 415, 416, 417, 418, 422, 431, 444, 470, 474, 550, 628, 629.
  abnormal mobility of, 48, 50.
  deliberate, 48, 49.
  paralysis of, 48.
  spontaneous, 48.
  voluntary, 48, 49.
  weakening of 49, 50, 51, 231, 253, 277, 286, 287, 290.
Attitudes, stereotypy of, 72, 232, 238, 242.
Aura, epileptic, 81, 206.

Authority, parental, 124.
Autistic personality, *see* Personality, autistic or shut-in.
Autistic thinking, 137–139, 636.
Autochthonous ideas, *see* Ideas, autochthonous.
Auto-critical faculty, 47, 84, 199, 366.
Auto-erotic manifestations, 121.
Auto-intoxication, 256, 281, 346, 347, 396, 429, 431.
Automatic antagonism, 72.
Automatic reactions, *see* Reactions, automatic.
Automatic writing, 37.
Automatism, epileptic, 207, 637.
Automatism, mental, 38, 42, 50, 51, 52, 53, 70, 85, 236, 237, 238, 251, 258, 268, 286, 287, 288, 319, 332, 333, 422, 424, 425, 426, 429, 444.
Automatism, negative, 72, 73.
Autopsy, 38, 39, 367, 368, 396, 399, 405, 409, 439, 629. *See also* Pathological anatomy.
Autopsychic orientation, *see* Orientation, autopsychic.
Auto-suggestion, 312.
Auto-toxic psychoses, 194.
Average, 93.
Awareness, 120.
Axonal alteration, 439.

Babinski sign, 81, 366, 382, 388, 441.
Background thoughts, 143.
Bacteriolysis, 461.
Balancing power, 81.
Basal nuclei, 410.
Bashfulness, 319.
Baths, cold, 421.
Baths, continuous, *see* Continuous baths.
Bed-sores, 384, 402.
Begging, 228
Behavior, antisocial, *see* Antisocial behavior.
Belladonna, 436.
Benevolence, 387.
Bestiality, 224, 225.
Bewilderment, 424, 634, 637.
Bhang, 355, 356.
Bias of judgment, 183, 218.
Binet-Simon tests, 88, 90, 91, 96, 169, 185.
  Stanford revision, 96, 198, 476–546.
Blocking, 73.
Blood changes, 378, 396.
Blood letting, 430.
Blood pressure, 64, 69, 81, 295, 361, 408, 428, 630.
Blood tests, 80, 89, 367, 401, 438.
Blood vessels, 392, 393, 394.
Blues, 78, 79.
Blushing, 323.
Boarding out, 202, 204.
Bones, abnormal fragility of, 383.
Borderline conditions, 100, 195, 198.
Bordet-Gengou phenomenon, 461, 462.
Boulimia, 234, 385.
Bowels, condition of, 80, 412.
Brachial paralysis, 409.
Brachycephaly, 197
Brain abscess, 437, 438.
Brain atrophy, *see* Atrophy, brain.
Brain tumor, xiv, 38, 89, 367, 386, 391, 437–438, 449, 458, 625, 631.
Brain weight, 261, 392, 448.
Bribery, 359.
Bringing up, 79, 122, 179.
Bromides, 626, 633.
  in delirium tremens, 348
  in epilepsy, 213, 214.
  in excitement, 106.
  in general paralysis, 404.

Bromides in hyperthyroidism, 436.
  in manic-depressive psychoses, 289, 290
Brocho-pneumonia, *see* Pneumonia.
Business troubles, 10, 79.
Butyric acid test, Noguchi's, 89, 391, 459.

Cachexia, 69, 251, 353, 354, 427, 433, 435.
  in general paralysis, 374, 385, 389.
  in involutional melancholia, 298.
  in morphinism, 361, 362.
  in senile dementia, 448.
Caffein, 214, 334, 348, 362.
Calculating ability, 200.
Calligraphic disorders, 85.
Cancelling A test, 621, 623.
Capacity for work, *see* Work, capacity for.
Capacity of institutions, 173.
Cardio-vascular disorders, 64, 67, 69, 385, 423, 430, 446, 635.
Career, 179, 221.
Case history, *see* History.
Catalepsy, 71, 239, 241, 280, 374, 426, 429
Catatonia, 41, 71, 82, 108, 109, 110, 229, 230, 233, 236–243, 244, 253, 254, 286, 635.
Catatonic excitement, 211, 236–243, 254, 290, 637.
Catatonic stupor, 233, 234, 236–243, 252, 254, 637.
Catharsis, psychic, 145.
Causes, 1, 80, 195. *See also* Etiology.
  avoidable, 119.
  contributing, 1, 2, 7, 9, 10, 11, 80, 165, 179, 628.
  essential, 1, 8, 9, 10, 11, 165, 255, 285, 292, 413.
  exciting, 118, 399.
Causes, incidental, 1, 2, 7, 9, 10, 11, 80, 165, 179, 628.
  physical, 10, 78, 303, 304.
  psychic, 10, 303, 304.
Cell count, 89, 364, 449, 452–454.
Censor, psychic, 128, 130, 131, 136, 138.
Central neuritis, 437, 438–442, 633.
Central scotoma, 337.
Cerea flexibilitas, 71, 73.
Cerebellar arteries, 409.
Cerebral abscess, 437, 438.
Cerebral apoplexy, 385, 410, 412, 448.
Cerebral arteriosclerosis, xiv, 8, 89, 194, 293, 298, 367, 368, 405–412, 457, 625, 628, 629.
Cerebral compression, 413, 414.
Cerebral concussion, 304, 413, 414, 628.
Cerebral embolism, 408, 412, 626, 632.
Cerebral hemorrhage, 391, 408, 410, 629.
Cerebral infarction, 400, 408, 410.
Cerebral softening, 391, 408, 629.
Cerebral syphilis, 8, 89, 90, 194, 364–369, 391, 393, 454, 625, 630.
  diagnosis, 367–369.
  early involvement, 364, 365.
  endarteritic type, 367, 457, 630, 631.
  gummatous type, 367, 457, 630; 631.
  meningitic type, 365–367, 630.
  prognosis, 369.
  symptoms, 364–367.
  treatment, 368–369.
Cerebral thrombosis, 408.
Cerebral tumor, *see* Brain tumor.
Cerebropathia psychica toxæmica, 634.

Cerebro-spinal fluid, 89, 178, 211, 364, 365, 367, 368, 390, 391, 396, 401, 438, 449, 468.
Certificate of insanity, 102.
Chancre, 365, 396, 401.
Changeable mood, 62, 371.
Character anomalies, 98, 100, 139, 207, 215, 220, 262, 316, 318, 357, 371, 630.
Charas, 355.
Charitable organizations, v, 191, 192, 215, 217.
Cheating, 269, 317.
Chemical tests, 89, 449.
Child-bearing age, 203, 204.
Childbirth, 10, 119, 256.
Childhood, events of, 45, 78, 127, 128, 131, 138.
Chloral, 105, 106, 214, 348, 404, 626, 633.
Chloralose, 106.
Choked disc, 449, 631.
Cholera, 427.
Chorea, acute, 626, 632.
Chorea, Huntington's, *see* Huntington's chorea.
Choreiform movements, 81, 382, 411.
Christian Science, 114.
Chromatolysis, 334, 393, 448.
Chronic alcoholism, *see* Alcoholism, chronic.
Chronic mania, 290, 291.
Chronological age, 95.
Circle of Willis, 405, 406, 407.
Circular psychoses, 282, 283, 284, 287, 288, 289, 626, 635.
Circulatory disorders, 64, 234, 256, 271, 278, 294, 360, 423. *See also* Pulse.
Classification, 193, 194, 260, 625–640.
  sociological, 191
Claustrophobia, 323.
Clavus hystericus, 233.
Clinical summary, 86.
Clinics, out-patient, 119, 147, 153, 155.
Clitoris, 122, 123.
Clouding of consciousness, *see* Consciousness, clouding of.
Clumsiness, 335.
Coca, 355, 356.
Cocaine, 8, 112, 194, 357, 626, 633.
Cocaine delirium, 35, 363.
Cocainism, 30, 119, 363.
Coenæsthesia, 73, 74.
Cold baths, 421.
Cold douche, 104.
Collapse, 214, 333, 361, 362, 427, 433, 442.
Collapse delirium, 634.
Collateral heredity, 2.
Colloidal gold test, Lange's, 89, 368, 391, 452, 455–458.
Colony, 78, 204.
Coma, 40, 332, 414, 415, 416, 421, 426, 438.
Comatose drunkenness, 332, 334.
Combined sclerosis, 382, 394.
Commitment, xiv, 11, 80, 82, 83, 101–103, 117, 159, 161, 181, 264, 266, 322, 350, 448, 639, 640.
Common reactions, 548, 551, 552, 553.
Common-sense thinking, 137–139.
Competence, legal, 181, 182, 183.
Complacency, 270.
Complement, 460, 462.
  absorption or fixation of, 461.
Complete dissociation, 552.
Completion test, Trabue's, 621, 623.
Complexes, sexual, 121, 135, 302.
Complexes, subconscious, 91, 99, 120, 140, 145, 301, 548, 638.
Compression, cerebral, 413, 414.
Compunction, 270, 317.

Conceit, 218, 262, 263.
Concussion, cerebral, 304, 413, 414, 628.
Condensation in dreams, 135.
Conduct, xiv, 61, 78, 82, 92, 97, 139, 220, 237, 258, 301, 374, 389.
Confabulations, *see* Fabrications.
Confidence, 113, 140.
Conflict, intrapsychic, 131, 259, 314, 315, 638.
Confused mania, 267, 275, 276.
Confusion, 19, 29, 42, 65, 231, 236, 243, 251, 292, 295, 345, 373, 386, 387, 409, 411, 415, 417, 419, 421, 422–428, 430, 438, 441, 628, 629, 630, 631, 632, 633, 634, 637, 639.
Congenital syphilis, 78.
Conjugal general paralysis, 399.
Conscientious objectors, 218.
Conscious motives, 310.
Consciousness, 20, 28, 33, 40–42, 46, 47, 49, 51, 52, 65, 67, 68, 70, 74, 81, 127, 129, 140, 142, 214, 237, 251, 253, 298, 300, 301, 310, 319, 320, 336, 342, 348, 366, 373, 414, 415, 638.
Consciousness, clouding of, 26, 27, 41, 48, 208, 272, 275, 333, 419, 420, 422, 429, 430.
Consciousness, field of, 40, 43, 48, 50, 52, 65, 120.
Consciousness, loss of, 81, 386, 409, 417.
Conservation, amnesia of, 43, 44, 445.
Constipation, 64, 234, 279, 294, 298, 318, 338, 385, 423, 432.
Constitutional disorders, 11, 15, 16, 100, 193, 260, 316, 327, 397, 639.
Constitutional inferiority, 159, 260, 627, 638, 639, 640.
Constitutional make-up, *see* Make-up, psychic, *also* Personality.
Constitutional psychopathic states, xiii, 6, 11, 62, 65, 71, 172, 191, 192, 193, 215–228, 300, 316, 357. *See also* Constitutional inferiority.
Consultations, expert, 91, 93.
Contemplation, 142.
Content of dreams, latent, 128, 129, 133, 137.
Content of dreams, manifest, 128, 129, 135, 136, 137.
Content of psychoses, 80, 120.
Content, total mental, 120.
Continuous baths, 104, 105, 299.
Contractures, 233, 300, 303, 309, 312, 381, 403, 410.
Contrary reactions, 73.
Contributing causes, *see* Causes, contributing.
Convalescence, 22, 25, 30, 55, 154, 281, 294, 298, 345, 348, 414, 416, 426, 428, 634.
Conventionalities, regard for, 332, 359, 374, 389.
Convergent heredity, 327.
Conversion, 121, 302, 638.
Convulsions, 77, 79, 81, 206, 213, 233, 300, 313, 366, 367, 382, 386, 403, 404, 412, 430.
Convulsive drunkenness, 333.
Cooperation, 76, 81, 82, 97, 631.
Coordination, muscular, 7, 81.
Coprolalia, 321.
Corruption, 203.
Cortical or short arterioles, 405, 407, 408.
Course of psychoses, 80, 86, 253, 255, 276, 280, 282, 348, 349, 387, 389, 411, 426, 432, 448, 630, 636.
Courts of law, v, 150, 181, 182, 192, 215.
Cowardice, 220.
Cramps, abdominal, 361.
Cranial capacity, 261.

Cranial malformations, 80, 197.
Cranial nerves, 364, 366, 630.
Credulity, 263.
Cretinism, 431, 433, 435.
Crime, 26, 177, 185, 189, 190, 203, 208.
Criminality, 2, 71, 78, 79, 148, 191, 197, 202, 215, 216, 219, 221, 303, 317, 332, 357, 383, 387, 639.
Criminal responsibility, xiv, 181, 183–185.
Crises, organic, 378.
Critique, 141.
Critique, suspension of, 128, 142.
Cruelty, 220.
Crural monoplegia, 409.
Culpability, ideas of, *see* Ideas of culpability.
Cup feeding, 110, 241.
Curiosity, 357.
Curves of distribution, normal, 93, 100.
Custody, xiv, 78, 117, 170, 173, 203, 204.
Cutaneous reflexes, 337, 344, 382.
Cyanosis, 65, 80, 234, 278, 295, 423.
Cynicism, 269, 270.

Dangerous tendencies, 26, 102, 117, 236, 261, 295.
Dark field illumination, 401.
Day dreaming, 128, 138.
Deaf-mutism, 306, 309.
Deafness, 30, 300, 309, 364, 366, 382, 383, 409, 418.
Death, 214, 252, 276, 293, 294, 298, 329, 333, 345, 346, 348, 353, 354, 369, 376, 385, 387, 388, 390, 403, 409, 412, 414, 421, 426, 427, 433, 436, 442, 447, 448, 449, 635.
Death of relatives, 11, 294.
Death of relatives, dreams of, 130, 131.
Debauchery, 203.
Decency, violations of, 223, 383, 387, 389.
Deception, 220, 310, 316.
Decline of mental disorders, 164.
Defective delinquents, 169, 170, 203.
Deformities, cranial, 80, 197.
Degeneration, anatomical stigmata of, 197.
Deglutition, disorders of, 376, 403.
Dejection, 81. *See also* Depression.
Delayed talking, 77, 79, 197.
Delayed walking, 77, 79, 197.
Delinquents, defective, 169, 170, 203.
Delinquents, juvenile, 186.
Délire chronique à évolution systematique, 248–251, 266, 350.
Délire du toucher, 323.
Delirium, 42, 333, 339, 366, 409, 420, 435, 626, 633, 634, 638.
Delirium, cocaine, 35, 363.
Delirium, collapse, 634.
Delirium, epileptic, 26, 29, 42, 43, 74, 207–211, 280.
Delirium, exhaustion, 10, 626, 634, 635.
Delirium, febrile, 10, 33, 103, 413, 419–421, 634.
Delirium, hallucinatory, 29, 342, 421, 425.
Delirium, infectious, 21, 211, 413, 419–421, 634, 635.
Delirium, initial, 421, 634.
Delirium, mystic, 68, 429.
Delirium, occupation, 211, 343.
Delirium, senile, 447, 625, 629.
Delirium, toxic, 33, 68, 419, 429.
Delirium, transitory, 211.
Delirium, traumatic, 9, 194, 414–416, 625, 628.
Delirium tremens, 7, 26, 35, 40, 194, 211, 251, 252, 286, 337,

342–348, 413, 430, 447, 626, 632.
complications, 345.
diagnosis, 345.
pathogenesis, 346.
pathological anatomy, 346.
physical symptoms, 344.
prevention of, 348.
prodromata, 342, 348.
prognosis, 344, 345.
psychic, symptoms, 342–344.
treatment, 347–348.
Delirium, uræmic, 429, 430.
Delusional depression, 277, 279, 280.
Delusional drunkenness, 333, 334.
Delusional interpretations, *see* Interpretations, delusional or false.
Delusional mania, 267, 271–275.
Delusional melancholia, 295, 296.
Delusional states, alcoholic, *see* Alcoholic delusional states.
Delusions, xiii, xiv, 28, 41, 54, 55, 63, 66, 67, 75, 82, 83, 85, 86, 108, 109, 110, 115, 200, 208, 210, 236, 237, 245, 248, 250, 251, 254, 262, 263, 264, 265, 266, 272, 279, 280, 288, 295, 296, 297, 298, 333, 336, 345, 350, 351, 363, 379, 380, 389, 390, 420, 425, 429, 443, 444, 447, 629, 635, 637. *See also* Ideas.
absurd, 59, 255, 279, 379, 425, 446, 447, 637.
contradictory, 379.
incoherent, 25, 55, 243, 247, 255, 275, 380, 387.
mechanisms of, 66, 127.
mobile, 271, 379.
multiple, 55, 379.
polymorphous, 244.
systematized, 26, 55, 59, 60, 243, 244, 246, 247, 249, 250, 254, 279, 349, 350, 379, 380, 430.
Dementia, xiii, 22, 24, 31, 35, 44, 55, 59, 61, 62, 64, 96, 102, 105, 225, 231, 232, 244, 245, 246, 249, 250, 252, 254, 298, 361, 366, 380, 403, 410, 412, 432, 437, 444, 447. *See also* Mental deterioration.
Dementia, alcoholic, *see* Alcoholic dementia.
Dementia, arteriosclerotic, 88. *See also* Cerebral arteriosclerosis.
Dementia, epileptic, 200, 206, 637.
Dementia paralytica, *see* General paralysis.
Dementia præcox, 6, 9, 12, 14, 16, 29, 44, 51, 52, 60, 62, 102, 109, 192, 193, 227, 229–261, 279, 285, 286, 290, 319, 327, 338, 350, 377, 390, 425, 627, 6628, 32, 633, 635, 636, 639, 640.
catatonic form, 236–243.
common symptoms, 230–234.
delusional forms, 243–251.
diagnosis, 251, 252.
etiology, 255.
hebephrenic form, 229, 627, 636.
paranoid form, 627, 636. *See also* delusional forms *and* Paranoid dementia.
pathological anatomy, 260, 261.
prognosis, 252.
psychoses allied to, 100, 260, 636.
simple form, 234, 235, 627, 637.
somatic disorders, 233.
theories of, 256–260.
treatment, 261.
Dementia, senile, *see* Senile dementia.
Dementia, traumatic, 9, 194, 418, 628.

Demorphinization, 361, 362, 363.
Dependency, 148, 191, 197, 200, 201, 203, 215.
Deportation of defective immigrants, 180.
Depression, xiv, 19, 28, 61, 63–69, 74, 82, 99, 108, 200, 201, 236, 237, 240, 243, 244, 245, 247, 252, 267, 269, 276, 277, 278, 280, 281, 282, 286, 287, 288, 289, 290, 291, 294, 297, 319, 324, 349, 367, 387, 389, 408, 429, 441, 445, 447, 625, 628, 629, 630, 631, 634, 635, 636, 638, 639. *See also* Psychic pain *and* Sadness.
  active, 63, 65, 68, 292.
  delusional, 277, 279, 280.
  passive, 63, 68, 278.
  recurrent, 283.
  simple, 277, 279, 280.
  stuporous, 74, 277, 280.
Dermatographia, 234.
Desertion, 11.
Despair, 63, 66, 285, 295, 372.
Deterioration, mental, *see* Mental deterioration.
Determiners, germ-plasmic, 2, 3.
Determinism, psychic, 120.
Development, arrests of, *see* Arrests of development.
Development, mental, 78, 90.
Development, normal course of, 474, 475.
Development, sexual, 122–124.
Developmental units, 95.
Diabetes, 91.
Diagnosis, 28, 45, 76, 86, 88, 89, 91, 98, 102, 150, 151, 152, 173, 174, 180, 201, 202, 210, 251, 252, 265, 266, 285, 301, 345, 350, 354, 360, 367, 390, 411, 427, 430, 437, 438, 448, 630, 631, 640.
Diagnosis, differential, 303, 309, 310, 312, 313, 338, 350, 368. 391, 411, 419, 438, 448 449, 629.
Diaphoretics, 430.
Diarrhœa, 68, 361, 385, 441, 442, 638.
Diet, 213, 281, 311, 348, 354, 362, 428, 446.
Differential psychology, 100.
Digestive disorders, 64, 234, 279, 292, 294, 298, 338, 345, 423, 432.
Digitalein, 348.
Digitalis, 362.
Digit-span test, 621, 622.
Diplopia, 372.
Dipsomania, 77, 321, 632.
Direct heredity, 2.
Directed thinking, 137–139.
Disability, 300, 374.
Disaggregation, psychic, 51, 58, 75, 245, 250, 361.
Disappointment in love, 11.
Discharge of patients, 77, 117–119, 173.
Discipline, 204, 220, 306.
Disconnectedness, 51, 82, 332, 414, 420.
Discouragement, 63, 70, 219, 277, 285, 297, 319, 371, 372.
Disgust for existence, 108.
Disgust for food, 109.
Disheveled appearance, 81.
Dishonesty, 126, 269, 316.
Disorientation, 40, 65, 251, 275, 286, 352, 353, 354, 408, 414, 415, 424, 426, 429, 447, 628, 632.
  allopsychic, 41, 252, 320.
  autopsychic, 74.
  of person, 74.
  of place, 208, 415, 444.
  of time, 46, 208, 415, 444.
Displacement of affect, 129, 135, 136.

Disregard for others, 125.
Dissatisfaction, 328.
Dissimilar heredity, 2, 327.
Dissimulation, 86.
Dissipated persons, 397.
Dissociation, complete, 552.
Dissociation, partial, 552.
Distractibility, 48, 82, 92, 268, 274, 332.
Distribution, normal curves of, 93, 100.
Distrustfulness, 349.
Disturbed patients, 105. *See also* Excitement.
Diversion, therapeutic, 261.
Dizziness, 364, 365, 408, 417, 452, 629, 630, 631, 638.
Dolichocephaly, 197.
Domestic troubles, 10, 79, 148, 340.
Dominant condition, 3, 5, 328.
Dormitories, 104, 105.
Dotards, xiv, 445.
Doubling of personality, 301.
Doubt, 278, 319, 321, 324, 638.
Doubtful reactions, 548, 551, 552, 553.
Doubting mania, 322, 323.
Douche, cold, 104.
Dramatization in dreams, *see* Moulding for presentability.
Dream delirium, 55, 420.
Dream stimuli, 127, 128.
Dream thinking, 135–139.
Dreams, 27, 127–137, 138, 141, 209, 344, 350, 415.
  affect in, 130, 137.
  biological purpose of, 129.
  condensation in, 135.
  displacement in, 136.
  distortion in, 128, 136.
  egotistic nature of, 136.
  exhibitionism in, 131.
  forgetting of, 128, 209.
  in chronic alcoholism, 337.
Dreams, interpretation of, 127–137, 142–145.
  latent content of, 128, 129, 133, 137.
  manifest content of, 128, 129, 135, 136, 137.
  material of, 127, 128, 129.
  mechanisms of, 127, 135.
  occupation, 337, 415.
  of death of relatives, 130, 131.
  of falling, 130, 131.
  of nakedness, 130, 131.
  peculiarities of, 127, 128.
  sexual material of, 130, 133.
  substitution in, 137.
  symbolism in, 131, 133, 134, 135, 144.
  theory of, 128.
  typical, 130.
Dress, 60, 237, 268, 272.
Dropsy, 80.
Drowsiness, 408.
Drug addictions, 2, 8, 77, 148, 165, 166, 167, 170, 172, 174, 178, 191, 194, 215, 216, 331, 347, 355–363, 627, 640.
Drunkards, 203.
Drunkenness, 7, 177, 331–334, 346.
  comatose, 332, 334.
  common, 332.
  convulsive, 333.
  delusional, 333, 334.
  maniacal, 333, 334.
  pathological, 194, 331–334, 626, 632.
  treatment, 334.
"Dry retching," 338.
Ductless glands, 626, 634, 635.
Duplex inheritance, 4.
Duplicity, 205.
Dura mater, lesions of, 330, 392.
Duration of psychoses, 33, 80, 103, 210, 276, 280, 294, 299, 345,

348, 350, 354, 363, 387, 390, 414, 426, 448.
Dynamometer test, 81.
Dysarthria, 410.
Dyspepsia, 294, 345.
Dysphagia, 409, 441.
Dyspnœa, 430.

Ears, abnormalities of, 30, 91.
Eccentricities, 78, 79, 296, 303.
Echolalia, 71, 239, 471.
Echo of thought, 245, 250.
Echopraxia, 71, 239.
Eclampsia, 78.
Ecstasy, 25, 68, 210, 258, 637.
Education, 1, 16, 24, 83, 90, 139, 150, 155, 171, 179, 184, 197, 202, 212, 220, 228, 318.
Educational psychology, 99.
Educational therapeutics, 99.
Efficiency, intellectual, 174.
Egotistic nature of dreams, 136.
Elation, *see* Euphoria.
Emaciation, 241, 298, 324, 361, 441, 442.
Embarrassment, 130, 482.
Embezzlers, 357.
Embolism, cerebral, 408, 412, 626, 632.
Emissions, seminal, 319.
Emotional control, 202, 629.
Emotional disorders, 302, 304.
Emotional instability, 216, 219, 285, 310, 408.
Emotions, *see* Affectivity.
Employment, 10, 173, 202, 204.
Encephalitis, chronic diffuse interstitial, 409.
Endarteritis, 365, 367, 399, 407, 411.
End-pleasure, sexual, 122.
Endurance, lack of, 318.
Energy, 317.
Enterprise, 317.
Enuresis, nocturnal, 122.
Environmental factors, 11, 76, 80, 124, 151, 153, 162, 179, 184, 201, 356, 400.
Environment, rural, 14, 401.
Environment, urban, 14, 17, 401.
Ependymal granulations, 392, 394.
Epidemics of suicide, 108.
Epilepsy, xiv, 2, 6, 9, 11, 12, 42, 68, 71, 77, 122, 159, 172, 173, 174, 191, 192, 193, 196, 200, 203, 205–214, 215, 216, 221, 225, 227, 260, 289, 303, 313, 316, 327, 333, 386, 390, 417, 627, 632, 637, 640.
  Jacksonian, 345, 386, 417, 438.
  masked, 210.
  paroxysmal mental disorders in, 205–211.
  permanent mental disorders in, 205, 206.
  prevention of, 212.
  senile, 447.
  traumatic 9, 194, 417, 418, 628.
  treatment of, 212–214.
Epileptic absence, 42, 207.
Epileptic aura, 81, 206.
Epileptic automatism, 207, 637.
Epileptic delirium, 26, 29, 42, 43, 74, 207–211, 280.
  diagnosis, 210, 211.
  duration, 210.
  symptoms, 208–210.
  treatment, 214.
Epileptic dementia, 200, 206, 637
Epileptic furor, 68, 208.
Epileptic mania, 211.
Epileptic personality, 205.
Epileptic stupor, 207, 210.
Epileptic vertigo, 206.
Epileptiform seizures, in acute alcoholism, 333.
  in brain tumor, 438.
  in cerebral arteriosclerosis, 408, 410.
  in cerebral syphilis, 367.

Epileptiform seizures, in delirium tremens, 345.
in dementia præcox, 233, 256.
in drug addictions, 361, 363.
in general paralysis, 372, 375, 379, 382, 386, 390.
in malingering, 309.
in senile dementia, 447.
Erogenous zones, 121, 122.
Eroticism, 202, 223, 243, 268, 269, 447.
Errors, motivated, 127.
Errors, orthographic, 376.
Eruptions, 80, 384, 399.
Eruptive fevers, 427.
Erythrophobia, 323.
Escape of thought, 37.
Essential causes, *see* Causes, essential.
État criblé, 410.
Ether, 214, 334, 348.
Ethical motives, 141.
Etiology, 1, 77, 80, 118, 193, 195, 212, 255, 284, 301, 303, 304, 306, 339, 356, 357, 395–401, 413, 427, 434, 439, 443, 640. *See also* Causes.
Eugenics, 155, 164, 171, 180, 212.
Euphoria, 61, 68–70, 210, 219, 243, 267, 268, 271, 275, 282, 293, 331, 332, 353, 358, 371, 387, 389, 445, 447, 448.
active, 68.
calm, 68.
Exacerbation, 103, 280.
Examination for aphasia, 470–473.
Examination, mental, 59, 81–86, 202.
Examination, methods of, 76, 80–87.
Examination, physical, 80, 140, 202.
Excitement, xiv, 41, 68, 69, 70, 82, 99, 101, 102, 104, 214, 240, 242, 243, 244, 247, 251, 253, 261, 267, 269, 270, 271, 275, 276, 280, 281, 282, 286, 287, 288, 289, 290, 291, 331, 332, 333, 342, 343, 350, 361, 367, 373, 375, 380, 387, 389, 402, 411, 420, 421, 425, 426, 632, 634, 636, 637, 639.
catatonic, 211, 236–243, 254, 290, 637.
in general paralysis, 373, 375, 380, 387, 389, 402.
in mental deficiency, 200–201.
treatment of, 103–107.
Exciting causes, 118, 399.
Exercise, 428.
Exhaustion delirium, 10, 626, 634, 635.
Exhaustion psychoses, 194, 391, 422–428, 634.
Exhibitionism, 131, 224, 225, 383.
in childhood, 131.
in dreams, 131.
Exophthalmic goiter, 431, 435–436.
Expansiveness, 68, 429.
Experimental pharmaco-psychology, 99.
Experimental psychopathology, 99.
Expert witnesses, 183.
Expression, facial, 67, 69, 207, 222, 268, 295, 361, 426, 431. *See also* Physiognomy.
Extramural psychiatry, 190–192.
Exuberant temperament, 285.
Eye color, heredity of, 3, 259.
Eyes, abnormalities of, 91.

Fabrications, 221, 352, 354, 414, 415, 416, 629, 632.
Facetiousness, 631, 633.
Facial expression, *see* Expression, facial.
Facial paralysis, 344, 366, 381, 409.

Fainting spells, 77, 79, 206, 233, 303, 318, 408, 441, 629.
Faith, in psychotherapy, 113, 114.
Falling, dreams of, 130, 131.
False ideas, 54.
False interpretations, *see* Interpretations, delusional or false.
Family history, *see* History, family.
Family suicide, 108, 296, 322.
Fanaticism, 205.
Fatigability, 252, 292, 373, 408, 416, 628, 629, 638.
Fatigue, 50, 70, 332, 360, 371, 638.
Faultfinding, 257, 258.
Fear, 28, 108, 109, 130, 131, 133, 258, 279, 280, 319, 324, 325, 326, 447, 479, 632, 637, 638.
Febrile delirium, *see* Delirium, febrile.
Feeble-mindedness, 2, 24, 26, 98, 148, 169, 170, 173, 185, 187, 188, 189, 190, 191, 195–204, 206, 212, 215, 216, 220, 221, 265, 303, 310, 551, 639. *See also* Arrests of development *and* Mental deficiency.
Feeding, cup, 110, 241.
  forced, 110, 299, 428.
  rectal, 214.
  spoon, 110.
  tube, 110–112, 241, 298.
Female sex, *see* Sex.
Fetichism, 224, 225.
Fever, 344, 421, 423, 438, 442.
Fibrosis, arterio-capillary, 408.
Field investigation, 77, 154.
Filial paranoiacs, 265.
Filthy tendencies, 239, 241, 276, 280, 402, 446.
Financial difficulties, 10, 294, 340, 444.
Financing of institutions, 171, 187.
Fixation, amnesia of, *see* Amnesia of fixation.
Fixed ideas, *see* Ideas, fixed.
Flexibilitas cerea, 71, 73.
Flexibility, waxy, 71, 73.
Flight of ideas, 50, 51, 52, 69, 82, 85, 211, 231, 267, 268, 275, 281, 282, 286, 287, 288, 290, 291, 293, 332, 373, 425, 447, 635.
Floating kidney, 318.
Flow of thought, 82, 91, 98. *See also* Disconnectedness, Flight of ideas *and* Incoherence.
Focal symptoms, 411, 438, 631.
Follow-up work, 153, 155.
Food, refusal of, *see* Refusal of food.
Forced feeding, 110, 299, 428.
Foreign-born insane, 17, 18.
Foreign or mixed parentage, 17, 18.
Fore-pleasure, sexual, 122, 124.
Forgetfulness, 125, 408, 416, 417, 628, 629, 630.
Forgetting, motivated, 124, 125, 126, 257.
Forgetting of dreams, 128, 209.
Form of psychoses, 120.
Fracture of skull, 79, 413, 628.
Fractures, spontaneous, 383.
Free association test (Kent-Rosanoff), 547–620.
Free will, xiv, 183, 184.
Frequency, surface of, 94.
Frequency tables, association, 554–602.
  appendix to, 603–620.
Friendliness, 140.
Fright, 304, 308.
Frigidity, sexual, 124, 223, 224.
Fuchs-Rosenthal counting chamber, 452, 453, 454.
Fumbling, 257.
Furor, epileptic, 68, 208.
Furunculosis, 361.
Futility, 319.

Gaiety, 298.
Gait, 81, 309, 332, 438, 441.
Gamblers, 357.
Ganglionic arterioles, 405, 406, 410.
Gangsters, 357.
Gonja, 355.
Gastric lavage, 112, 428.
Gastritis, 339.
Gastro-intestinal disorders, 281, 338, 347, 361, 362, 385, 417, 446, 448. *See also* Anorexia, Appetite, Constipation, Diarrhœa, "Dry retching," Dyspepsia, Indigestion, Nausea, Vomiting, etc.
General hospitals, psychopathic wards in, 181.
General nutrition, *see* Nutrition, general.
General paralysis, 8, 10, 12, 13, 14, 15, 16, 25, 28, 29, 38, 44, 45, 59, 61, 68, 69, 75, 86, 88, 89, 90, 109, 118, 192, 194, 211, 232, 251, 269, 286, 335, 338, 345, 346, 365, 366, 367, 368 370–404, 411, 413, 425, 438, 447, 448, 454, 457, 625, 628, 630, 631, 632.
  conjugal, 399.
  course, 389.
  diagnosis, 390.
  duration, 390.
  essential symptoms, 372–378.
  etiology, 395–401.
  forms, 386–389.
  galloping, 387, 390.
  inconstant symptoms, 378–386.
  infantile, 400.
  juvenile, 78, 400.
  pathological anatomy, 392–394.
  prevention, 401.
  prodromata, 371–372.
  prognosis, 389–390.
  remissions in, 118.
General paralysis, treatment, 402–404.
  treponema pallidum in, 396–399.
General paresis. *See* General paralysis.
General sensibility, hallucinations of, *see* Hallucinations of general sensibility.
Generative function, disorders of, 383.
Genes, 2.
Genital zones, 122.
Genius, 198.
German race, 12.
Germinal factors, 2.
Germ-plasmic determiners, 2, 3.
Gestures, 69, 237, 240, 243, 268, 271, 470.
Giddiness, 318. *See also* Dizziness.
Girdle sensation, 388.
Gliosis, perivascular, 407.
Globulin, 364, 450.
Globus hystericus, 233, 338.
Gloomy mood, 277, 282, 371, 372.
Goiter, exophthalmic, 431, 435–436.
Gothenburg system, 175, 176.
Grandeur, ideas of, *see* Ideas of grandeur.
Graphorrhœa, 271.
Grief, 256, 292, 340, 341.
Grimaces, 232, 238, 240, 270, 637.
Group tests, psychological, 97, 621–624.
Guardianship, 204.
Guiding idea, 49.
Guilt, 184, 185, 187.
Gummata, 8, 365, 367, 399.
Gustatory hallucinations, *see* Hallucinations, gustatory.
Gynecological troubles, 91.

Habit-forming drugs, 105, 177, 355–363.

Habits, 98, 99, 179, 203, 257, 258, 331.
Hæmatoma auris, 383, 384.
Hæmolysis, 460.
Hair, in hypothyroidism, 432, 435.
Hair despoilers, 225.
Hallucinations, xiii, 19, 21–39, 41, 53, 55, 58, 63, 82, 83, 102, 109, 206, 208, 210, 236, 237, 243, 244, 245, 246, 247, 249, 250, 251, 253, 254, 255, 258, 263, 266, 272, 275, 279, 280, 286, 288, 296, 320, 333, 342, 343, 344, 349, 350, 351, 353, 363, 379, 380, 387, 411, 419, 430, 441, 447, 631, 632, 633, 634, 635, 637, 639.
  agreeable, 25, 32, 35, 425, 426.
  auditory, 22, 30, 31, 32, 33, 53, 247, 296, 297, 348, 349, 363, 380, 425, 447.
  combined, 26, 27, 342, 425.
  conscious, 23, 25, 29.
  content of, 32.
  definitions of, 21, 22.
  diagnosis of, 27.
  etiology of, 29.
  genital, 35, 245, 250.
  gustatory, 34, 35, 250, 296, 349, 363.
  hypnagogic, 342.
  imperative, 26, 108.
  indifferent, 25.
  induced, 30, 344.
  motor, 35, 36, 37, 58, 75, 245, 250, 296, 297, 320, 349, 363.
  motor graphic, 37.
  motor verbal, 36, 37, 38, 53.
  of general sensibility, 35, 58, 250, 255, 296, 342.
  of memory, 46, 47, 352, 445.
  olfactory, 34, 35, 38, 250, 296, 349, 363.
Hallucinations, painful or unpleasant, 25, 26, 32, 35, 58, 243, 245, 249, 342, 425, 426, 429.
  peripheral, 29, 30.
  pleasing, 25, 32, 35, 425, 426.
  properties of, 22.
  psychic, 53, 54, 75.
  reflex, 29.
  suggested, 30.
  tactile, 35, 363.
  theories of, 38.
  unilateral, 29.
  verbal auditory, 31, 53, 58, 249.
  visual, 23, 30, 33, 34, 53, 240, 247, 250, 279, 296, 297, 342, 348, 363, 420, 425, 447.
Hallucinatory delirium, 29, 342, 421, 425.
Hallucinosis, acute, *see* Acute hallucinosis.
Hallucinosis, chronic, 626, 632.
Handwriting, 81, 85, 271, 278, 375, 376.
Hanging, suicidal, 108, 297.
Harping, 258.
Hashish, 355.
Hatred, 131.
Headache, 80, 235, 239, 279, 295, 297, 318, 342, 364, 365, 371, 408, 416, 417, 422, 433, 438, 452, 628, 629, 630, 631.
  sick, 78, 303.
Head injury, 2, 9, 10, 78, 79, 165, 178, 179, 399, 413, 414, 628. *See also* Traumatism.
Health board, 192, 215.
Hearing, hallucinations of, *see* Hallucinations, auditory.
Heart lesions, 80, 91, 106, 300, 346, 395, 399, 408.
Heart stimulants, 348, 362.
Hebephrenia, 229, 627, 636.
Hebetude, 631.
Hebrew race, 12.
Helmet sensation, 371.

Hemianæsthesia, crossed, 409.
Hemianopsia, 81, 367, 409, 438.
Hemiplegia, 233, 367, 381, 410, 438, 447.
Hemoglobin, 80, 378.
Hemorrhage, 10, 351, 408, 413, 414, 427, 634.
Hemorrhagic pachymeningitis, internal, 330, 392.
Hemp, Indian, 355.
Hereditary syphilis, *see* Syphilis, congenital or hereditary.
Heredity, 2, 9, 11, 18, 154, 165, 166, 170, 171, 174, 184, 195, 212, 239, 255, 259, 285, 292, 296, 303, 327, 339, 397, 434, 443, 631.
  atavistic, 2, 328.
  collateral, 2.
  convergent, 327.
  direct, 2.
  dissimilar, 2, 327.
  Mendelian theory of, 3.
  of eye color, 3, 259.
  similar, 2, 78, 285, 327.
Heroin, 8, 194, 357.
Herpes, 384.
History, clinical, 28, 88, 211, 395, 640.
  family, 76, 77, 78, 80, 167, 202, 215, 296, 303, 316, 327, 328, 356, 357, 397, 443, 631.
  of psychosis, 80, 118, 202.
  personal, 78, 167, 202, 215, 316, 356, 357, 368.
  social, 150, 202.
  taking, 76, 140, 151, 155.
  venereal, 76, 79.
Homicidal tendency, 26, 295, 321, 351.
Hopefulness, 140.
Hospitals, *see* Institutions.
Hostility, 132.
Humility, ideas of, *see* Ideas of humility.
Huntington's chorea, 11, 78, 193, 327–330, 625, 631.
Hydrocephalus, 78.
Hydrotherapy, 103, 104.
Hygiene, mental, *see* Mental hygiene.
Hygienic measures, 118, 212, 213, 258, 448.
Hyoscine, 107.
Hyperæsthesia, 309, 338, 344, 353, 360, 366, 381, 382, 638.
Hyperthyroidism, 431, 435–436.
Hypnagogic hallucinations, 342.
Hypnal, 106.
Hypnotics, 105–107, 308, 348.
Hypnotism, 71, 83, 113, 306, 312.
Hypoæsthesia, 300, 338, 382, 446.
Hypochondriacal disposition, 78, 79, 318.
Hypochondriacal ideas, *see* Ideas, hypochondriacal.
Hypochondriacal paranoiacs, 265.
Hypochondria cum materia, 56.
Hypodermic medication, 106, 107, 214, 360.
Hypothyroidism, 431–435.
Hysteria, xiv, 74, 77, 233, 258, 300–317, 318, 327, 627, 632, 638.
Hysteria, traumatic, 301, 308.
Hysterical personality, 303, 312, 316, 317.
Hysteriform seizures, 233, 235, 257, 295, 306, 338, 361.
Hystero-neurasthenia, 318.

Idea, guiding, 49.
Ideas, association of, *see* Association of ideas.
  autocthonous, 23, 50, 52, 53, 58, 75, 245, 250.
  community of, 99.
  expansive, 244.
  false, 54.

Ideas, fixed, 50, 52, 108, 218, 262, 263, 279, 288, 297, 320, 322, 420.
- hypochondriacal, 56, 57, 109, 245, 249, 258, 272, 277, 279, 296, 379, 441, 636, 638.
- imaginary, 54.
- imperative, 23, 50, 52, 53, 72, 226, 279, 288, 297, 319, 320, 321.
- melancholy, 55–59, 237, 243, 244, 245, 246, 275, 296, 333, 379, 388, 425, 429, 447.
- metaphysical, 57.
- mystic, 210, 245, 636.
- of culpability, 55, 56, 58, 245, 296, 379.
- of grandeur, 55, 59, 60, 210, 243, 246, 247, 250, 262, 271, 272, 273, 274, 275, 379, 387, 425, 447, 637.
- of humility, 55, 56, 245, 279, 296.
- of immensity, 57.
- of immortality, 57.
- of jealousy, 326, 349, 351, 363, 447, 633.
- of negation, 56, 57, 245, 296, 321, 379, 447.
- of persecution, 55, 57, 58, 59, 102, 108, 115, 201, 243, 246, 247, 249, 250, 262, 272, 275, 279, 296, 329, 333, 336, 349, 361, 379, 380, 425, 429, 441, 446, 447, 629, 633, 637.
- of possession, 37, 75, 245, 258.
- of reference, 258, 636.
- of ruin, 56, 245, 279, 296, 379, 447.
- of self-accusation, 55, 279, 297, 325, 447.
- stock of, 235, 335, 432, 445.
- subconscious, 91, 548, 637.
- undesired, 142.

Idiocy, 68, 74, 195–204, 232, 435, 639.

Illegitimacy, 10, 186, 203, 204.

Illiteracy, 16, 97, 201.

Ill-natured disposition, 62, 431.

Illness of relatives, 11.

Illuminating gas poisoning, 633.

Illusions, 19, 20, 21, 27, 36, 41, 206, 245, 249, 250, 272, 273, 275, 277, 279, 287, 296, 333, 342, 349, 353, 363, 380, 415, 419, 420, 425, 444, 635.
- of memory, 46, 47, 352, 445.

Imaginary ideas, 54.

Imaginary perceptions, *see* Hallunations.

Imbecility, xiv, 74, 85, 159, 195–204, 331, 435, 639.

Immensity, ideas of, 57.

Immigrants, deportation of, 180.

Immigration, 1, 17, 163, 180.

Immorality, 2, 148, 168, 170, 397.

Immortality, ideas of, 57.

Immune serum, 460.
- inactivation of, 460.
- reactivation of, 460.

Imperative hallucinations, 26, 108.

Imperative ideas, *see* Ideas, imperative.

Imposed morality, 316, 317.

Impotence, 319, 383.

Improvidence, 216.

Impulses, conscious, 72.
- homicidal, 321.
- morbid, xiii.
- of passion, 71, 72, 219.
- simple, 71, 72.
- suicidal, 321, 322.

Impulsiveness, 68, 71, 219, 221, 232, 295, 336, 389, 435, 636.

Impulsive obsessions, 225, 320, 321.

Impulsive reactions, *see* Reactions, impulsive.

Inaccessibility, 411, 640.

Inaccurate perceptions, *see* Illusions.

Inactivation of immune serum, 460.
Inadequate personality, 216, 258.
Inanition, 119, 427.
Incendiarism, 188, 189, 200.
Incest, 123.
Incidence of mental disorders, 163, 166.
Incidental causes, *see* Causes, contributing or incidental.
Incoherence, 50, 51, 52, 82, 85, 92, 231, 236, 240, 254, 425, 633.
Incoherent delusions, *see* Delusions, incoherent.
Incompetence, legal, xiv, 182.
Inconsistency, 205, 374.
Incoordination, muscular, *see* Muscular incoordination.
Increase of mental disorders (?), 160.
Indecision, 278, 422, 424.
Indian hemp, 355.
Indifference, 41, 61, 220, 224, 231, 235, 236, 243, 246, 248, 252, 253, 255, 258, 277, 278, 280, 286, 287, 335, 336, 353, 359, 373, 386, 425, 431, 445, 473, 636. *See also* Apathy.
  conscious, 62.
  unconscious, 62.
Indigestion, 234.
Individual differences, 100.
Individual reactions, *see* Reactions, individual.
Indolence, 200, 317.
Induced hallucinations, 30, 344.
Industrial organizations, 97, 150, 192.
Inebriety, 148, 173, 191, 212, 341, 357.
Inefficiency, 319.
Inertia, 64, 70, 280, 332, 431, 432, 631.
Infancy, 78, 79, 121, 195, 431, 474.
Infantile cerebral paralysis, 200.
Infantile fixation of libido, 124.
Infantile general paralysis, 400.
Infantile onanism, 122.
Infantile psychology, 131, 132.
Infantile sexuality, 121, 122, 124, 314.
Infarction, cerebral, 400, 408, 410.
Infectious delirium, *see* Delirium, infectious.
Infectious psychoses, 55, 194, 634.
Infections, 10, 78, 256, 257, 341, 347, 351, 388, 394, 413, 419, 427, 626.
Infelicity, domestic, 10, 11, 79.
Infidelity, marital, 11.
Infiltration, perivascular, 367, 393.
Infiltration, pial, 367, 393.
Infirmity, psychic, xiii, xiv, 11.
Influenza, 299, 346, 347, 351, 354, 427, 441, 634.
Inherited syphilis, *see* Syphilis, congenital or hereditary.
Inhibiting obsessions, 320, 322.
Inhibition, psychic, xiii, 57, 63, 66, 70, 99, 277, 280, 282, 287, 288, 293, 294, 295, 296, 298, 332, 361, 387, 635.
Initial delirium, 421, 634.
Initial lesion, 365, 396, 401.
Initiative, 216, 328.
Injury, head, *see* Head injury.
Inoffensive insane, 102.
Insane, foreign-born, 17, 18.
  in institutions, 160, 163, 173, 212.
  native, 17, 18.
  of foreign or mixed parentage, 17, 18.
  reasoning, *see* Paranoia.
Insanity, xiv, 1, 14, 15, 16, 17, 18, 26, 83, 148, 159, 177, 188, 190, 191, 221, 303.

Insanity, moral, 220.
  physicians' certificate of, 102.
  plea of, 185.
Insight, 54, 84, 269, 374, 408, 411, 416, 445.
Insomnia, 235, 236, 243, 271, 277, 292, 295, 297, 298, 361, 402, 408, 435, 634, 635.
Instability, emotional, 216, 219, 285, 310, 408.
Instincts, 26, 97, 258, 259, 636.
Institutions, v, 11, 14, 15, 17, 76, 77, 78, 100, 101-103, 108, 117, 118, 147, 154, 160, 161, 170, 173, 176, 181, 185, 192, 200, 261, 328, 340, 361, 379, 384, 402.
  accessibility of, 15.
  capacity of, 173.
  financing of, 171, 187.
Insufficiency of perception, *see* Perception, insufficiency of.
Intellectual efficiency, 174.
Intellectual obsessions, 320, 321.
Intelligence, degrees of, 24, 197, 198, 202, 318.
Intelligence, measuring scales of, 90, 95, 96.
Intelligence Quotient, 198, 480–481.
Intelligence tests, 90, 96.
Intemperance, 7, 9, 10, 11, 114, 159, 166, 176, 303, 340, 351, 356.
Interests, 61, 259, 418, 445, 628, 636, 637, 639.
Interference, psychic, 73.
Internal capsule, 410.
Internal hemorrhagic pachymeningitis, 330, 392.
Interpretation of dreams, 127–137, 142–145.
Interpretations, delusional or false, 54, 56, 58, 245, 249, 262, 263, 264, 296, 297, 349, 363, 633, 637.
Intimacy, 140.
Intoxications, 28, 79, 443.
Intracranial medication, 402.
Intracranial pressure, 89, 438, 449, 631.
Intrapsychic conflict, 131, 259, 314, 315, 638.
Intraspinal medication, 365, 401, 402.
Intrauterine life, 78, 195, 196.
Intravenous medication, 401.
Inventors-paranoiacs, 265.
Inversion, sexual, 78, 79, 223, 224, 226.
"Invisible ones," 32.
Involutional melancholia, 6, 13, 55, 62, 68, 108, 193, 245, 278, 279, 286, 292–299, 327, 387, 390, 448, 627, 635. *See also* Melancholia.
  causes, 292.
  duration, 299.
  prodromata, 292.
  prognosis, 294, 298.
  symptoms, 294–298.
  treatment, 299.
Iodides, 368.
Iodothyrine, 433.
Irish race, 12.
Iritis, 399.
Irrational conduct, xiv, 414.
Irritabilty, 62, 68, 71, 78, 79, 81, 102, 205, 207, 220, 235, 239, 243, 249, 267, 268, 269, 282, 288, 290, 292, 293, 296, 328, 329, 332, 335, 336, 344, 353, 371, 373, 389, 416, 419, 431, 445, 628, 629, 631, 634, 637, 638.
Isolation, 29, 103, 105, 109, 311, 334.
Italian race, 12.

Jacksonian epilepsy, 345, 386, 417, 438.

Jails, 186.
Jaundice, 68, 80.
Jealous paranoiacs, 265.
Jealousy, ideas of, *see* Ideas of jealousy.
Jendrassik reinforcement, 81.
Jerking, muscular, 318, 441.
Jewish race, 12.
Joy, *see* Euphoria.
Judgment, 23, 24, 25, 26, 28, 98, 127, 206, 216, 220, 268, 319, 320, 328, 335, 374, 445, 631.
  disorders of, 54–60, 182, 203, 215, 218, 221, 277, 387, 630.
Justices of the peace, 191.
Juvenile delinquents, 186.
Juvenile general paralysis, 78, 400.

Kent-Rosanoff test, 98, 547–620.
Kidney lesions, 346, 361, 385, 395. *See also* Albuminuria *and* Nephritis.
Kindness, 371.
Kleptomania, 321.
Knee jerks, 81, 300, 366, 382, 388, 441, 446, 630.
Korsakoff's psychosis, 351–354, 626, 632, 633.

Lactation, 10.
Lacunar softenings, *see* Slit-like defects.
Lamentations, 281, 295, 297, 298.
Lancinating paroxysms, 338, 371, 388.
Lange's colloidal gold test, 89, 368, 391, 452, 455–458.
Language ability, 98.
Lassitude, 63, 67, 337, 371.
Latent content of dreams, 128, 129, 133, 137.
Lateral sclerosis, 388.
Laughter, 232, 474, 475, 629, 637.
Lavage, gastric, 112, 428.
Lead poisoning, 457, 626, 633.
Learning, 98, 99.
Legal competence, 182.
Legal responsibility, 183.
Legislation against alcohol, 175.
Legislation against habit-forming drugs, 177.
Leucocytosis, 438.
Libido, infantile fixation of, 124.
Liepmann's phenomenon, 30.
Lightning pains, 338, 371, 388.
Listlessness, 277, 631.
Litigious paranoiacs, 265.
Liver lesions, 338, 339, 340, 346, 385, 395, 400.
Loafing, 315.
Loathing, 122.
Local option, 175, 177.
Logic, 60, 67, 263, 264, 270, 637.
Logical memory test, 621, 622.
Logical thinking, 137–139.
Logorrhœa, 271, 281, 282, 291.
Long or medullary arterioles, 405, 407, 408, 409.
Loquaciousness, 293, 387.
Loss of employment, 10, 119, 213.
Love, 123, 124, 131, 132, 140, 141.
Love affairs, 11.
Lucidity, 41, 62, 82, 206, 210, 211, 230, 238, 243, 244, 248, 264, 268, 271, 277, 280, 291, 293, 324, 332, 336, 349, 354, 359, 363, 414, 421, 425, 430, 448.
Lumbar puncture, 88, 89, 286, 364, 390, 401, 411, 449, 468, 630.
Luminal in epilepsy, 213, 214.
Lunacy, xiv.
Lying, pathological, 216, 221, 269, 317.
Lymphocytosis, 89, 367, 368, 390. *See also* Cell count.
Lymphoid cells, 367.
Lypemania, *see* Melancholia.

Macrocephaly, 197.
Macroscopic lesions, 392.

Make-up, psychic, 79, 90, 96, 98, 166, 167, 285, 303, 638, 639. *See also* Personality.
Maladjustment, sexual, 121.
  social, *see* Social maladjustment.
Malaise, 74.
Malaria, 634.
Male sex, *see* Sex.
Malformations, cranial, 80, 197.
Maliciousness, 220.
Malingering, 192, 308–314. *See also* Simulation.
Mania, 25, 35, 48, 50, 51, 52, 60, 68, 69, 71, 102, 236, 267–276, 277, 279, 280, 282, 286, 287, 288, 289, 361, 387, 444.
  chronic, 290, 291.
  confused, 267, 275, 276.
  delusional, 267, 271–275.
  epileptic, 211.
  recurrent, 283.
  simple, 267–271.
  transitory, 211.
Maniacal drunkenness, 333, 334.
Manic-depressive psychoses, 6, 9, 12, 14, 16, 44, 86, 99, 108, 115, 118, 174, 192, 193, 201, 211, 227, 243, 245, 259, 260, 267–291, 294, 327, 387, 390, 448, 627, 628, 632, 633, 635, 639, 640.
  circular types, 283, 627, 635.
  course of, 276, 280, 282.
  depressed types, 277, 293, 627, 635.
  diagnosis, 285, 286.
  duration, 276, 280.
  etiology, 284.
  homogeneity of, 276, 286.
  manic types, 267, 283, 627, 635.
  mixed types, 281, 282, 627, 635.
  prognosis, 276, 280, 282, 284.
  treatment, 276, 281, 282, 289.
Manic stupor, 281, 627, 635.
Manifest content of dreams, *see* Dreams, manifest content of.
Mannerisms, 237, 242, 637.
Marasmus, 378.
Marital condition, 1, 15, 79.
Marital infelicity, 11.
Marital infidelity, 11.
Marriage restriction, 171.
Masked epilepsy, 210.
Masochism, 224, 225.
Masturbation, 79, 122, 135, 224, 319, 366.
Maturity, measures in terms of, 95.
Measurements, mental, 88, 92–100, 202.
Measuring scales of intelligence, 90, 95, 96.
Mechanical restraint, 103, 347.
Mechanisms, etiologic, 80, 314.
  of delusions, 66, 127.
  of dreams, 127, 135.
  of obsessions, 127.
  of phobias, 127.
  psychic, 66, 100, 124, 137, 139, 300, 302, 306, 315, 318.
Median, 93.
Medical consultations, 91, 93.
Medication, 357.
  hypodermic, 106, 107, 214, 360.
  in delirium tremens, 348.
  in epilepsy, 213.
  in excitement, 103, 105.
  intracranial, 402.
  intraspinal, 365, 401, 402.
  intravenous, 401.
  rectal, 105, 106, 214, 404.
Medico-legal questions, 181, 208, 315, 387, 389.
Mediums, writing, 37.
Medulla, lesions of, 409.
Medullary or long arterioles, 405, 407, 408, 409.
Megalomaniacal syndromes, 245, 246.

Melancholia, 28, 38, 50, 58, 63, 65, 66, 67, 103, 110, 236, 267, 379. *See also* Involutional melancholia.
  agitated, 292.
  anxious, 292, 295, 296, 298.
  delusional, 295, 296.
  stuporous, 294, 295.
  wasting in, 298.
Melancholy ideas, *see* Ideas, melancholy.
Memory, 42–48, 62, 83, 86, 92, 95, 98, 182, 199, 200, 230, 231, 268, 329, 335, 351–354, 366, 372, 381, 386, 389, 415, 416, 418, 444, 628, 629, 630, 631, 633, 637.
  hallucinations of, 46, 47, 352, 445.
  illusions of, 46, 47, 352, 445.
Mendacity, 78, 79.
Mendelian theory of heredity, 3.
Meningitis, 38, 78, 345, 391, 454, 458, 626, 632.
Meningo-encephalitis, 38, 383.
Menstrual function, 68, 80, 271, 285, 294, 296.
Mental age, 95, 197, 198, 480.
Mental alienation, xiv, 52.
Mental automatism, *see* Automatism, mental.
Mental capacity, 83, 90, 91.
Mental confusion, 43, 44, 49, 52, 74, 251, 255, 286, 422–428, 441.
  delirious form, 422, 423, 425.
  hyperacute form, 423, 426, 427.
  simple form, 422, 423–425.
  stuporous form, 20, 423, 426.
Mental content, total, 120.
Mental deficiency, 96, 99, 139, 148, 172, 173, 174, 190, 192, 212, 215, 216, 227, 300. *See also* Arrests of development *and* Feeble-mindedness.
Mental deterioration, 25, 60, 99, 114, 200, 202, 219, 220, 227, 229, 234, 242, 243, 246, 253, 257, 259, 261, 263, 264, 266, 267, 286, 291, 293, 329, 335, 338, 339, 349, 354, 372, 379, 383, 386, 390, 402, 408, 409, 418, 438, 443, 445, 448, 629, 637, 640. *See also* Dementia.
Mental development, 78, 90.
  normal course of, 474, 475.
Mental examination, 59, 81–86, 202.
Mental hygiene, v, 148, 155, 165, 180, 258.
Mental infirmity, xiii, xiv, 11.
Mental measurements, 88, 92–100, 202.
Mental mechanisms, *see* Mechanisms.
Mental status, 92.
Mental tension, 629.
Mercury, 365, 368.
Mesoblastic neuro-syphilis, *see* Cerebral arteriosclerosis *and* Cerebral syphilis.
Metabolism, 64.
Metaphysical ideas, 57.
"Metasyphilitic" disorders, 396.
Methods of examination, 26, 80–87.
Microcephaly, 197.
Microscopic lesions, 392–394, 411.
Middle cerebral artery, 409.
Middle ear disease, 30, 438.
Migraine, 77.
Miliary plaques, 448.
Military recruits, *see* Recruits, military.
Milk diet, 348, 430.
Mischievousness, 269.
Misdemeanors, 387.
Miserliness, 78, 79.
Mistakes of identity, 21, 250, 272, 296. 415, 632

Mocking, 269.
Monomania, 55. *See also* Paranoia.
Monoplegia, 233, 381, 409, 438.
Monotony, 57, 211, 236, 240, 243, 295, 420.
Mood, 62, 205, 277, 282, 371, 372, 445. *See also* Affectivity.
Moral imbecility, 203, 220.
Moral insanity, 220.
Morality, æsthetic, 316, 317.
  imposed, 316, 317.
  prudent, 316, 317.
  pure, 316, 317.
  sexual, 123.
Moral sense, 122, 215, 219, 220, 269, 332, 336, 359, 374.
Moronism, 195, 197, 198, 639.
Morphine, 8, 105, 194, 357.
Morphinism, 119, 357–363.
  etiology, 356.
  evolution, 358–331.
  prognosis, 363.
  symptoms of abstinence in, 360–361.
  treatment, 361–363.
Motility, disorders of, 233, 372.
Motivated forgetting, 124, 125, 126, 257.
Motives, concealed, 304, 309, 315, 318.
  conscious, 310.
  ethical, 141.
  illicit, 304, 305, 315.
  unconscious, 120, 310.
Motor aphasia, 409.
Motor hallucinations, *see* Hallucinations, motor.
Motor reactions, 68.
Moulding for presentability (in dreams), 135, 136.
Multiple sclerosis, 375, 382, 437, 438, 457, 626, 632.
Murder, 26, 250, 336, 389.
Muscular atony, 318.
Muscular atrophy, 300, 374, 384.
Muscular coordination, 7, 81.
Muscular incoordination, 374, 375, 376, 409.
Muscular jerking, 318, 441.
Muscular rigidity, 388, 441.
Muscular twitching, 318, 375, 441.
Muscular weakness, 337, 360, 371, 374, 408, 416, 446.
Musical ability, 200.
Mutism, 37, 73, 81, 238, 240, 241, 243, 278, 300, 306, 307, 309, 312, 635.
Mydriasis, 233, 234, 377.
Myocarditis, 339, 385.
Myosis, 337, 377, 430, 446.
Mystic delirium, 68, 429.
Mystic ideas, 210, 245, 636.
Mystics-paranoiacs, 265.
Mythomania, 221.
Myxœdema, 431–433.

Nails, in hypothyroidism, 432.
Nakedness, dreams of, 130, 131.
Narcotics, 8, 355.
National Army, 8, 192, 216, 218, 305, 347.
National Committee for Mental Hygiene, 148, 173, 190, 212, 218, 311.
Native insane, 17, 18.
Nausea, 318, 638.
Necrophilia, 224, 226.
Negation, ideas of, *see* Ideas of negation.
Negative automatism, 72, 73.
Negativism, 72, 73, 82, 109, 232, 233, 238, 239, 241, 243, 254, 258, 295, 296, 374, 636, 637.
Negligence, 235, 280, 335.
Negro race, 12, 13, 552, 553.
Neologisms, 33, 135, 244, 247, 549, 550, 551, 552.
Nephritis, 91, 339, 346, 408. *See also* Albuminuria *and* Kidney lesions.

Nerve cells, 261, 330, 334, 339, 346, 384, 392, 394, 411, 427, 439, 448.
Nerve fibers, 339, 346, 393, 394, 439, 448.
"Nervous breakdown," 303, 319.
"Nervous prostration," 77, 319.
Neuralgia, 364, 366.
Neurasthenia, xiv, 77, 88, 258, 318–319, 371, 627, 638.
  sexual, 318, 319.
  splanchnic, 318.
Neuroglia, 394.
Neuropathic constitution, 5, 78, 179, 195, 215, 303, 327, 356, 397.
Neuropsychiatry, in war, *see* National Army, War neuroses, *and* World War.
Neuroses, *see* Psychoneuroses.
Neuro-syphilis, *see* Cerebral arteriosclerosis, Cerebral syphilis, *and* General paralysis.
Nightmares, 280, 337, 342, 431.
Nissl's corpuscles, 393.
Nocturnal enuresis, 122.
Noguchi's butyric acid test, 88, 391, 459.
Nomadism, 216, 227, 228.
Non-specific reactions, 548, 551, 552, 553.
Normal course of development, 474–475.
Normal curves of distribution, 93, 100.
Normal reactions, 548, 549, 551, 552, 603.
Nose, abnormalities of, 91.
Nosophobia, 323.
"Not insane," 172, 627, 639, 640.
Nulliplex inheritance, 4.
Nursing, 114, 402, 403.
Nutrition, general, 64, 69, 80, 234, 241, 256, 271, 294, 345, 360, 362, 372, 377, 378, 388, 431.
Nystagmus, 81.

Obscene language, 32, 37, 271, 389.
Obsessions, 65, 121, 141, 221, 319–326, 638.
  homicidal, 321, 322.
  impulsive, 225, 320, 321.
  inhibiting, 320, 322.
  intellectual, 320, 321.
  mechanisms of, 127.
  suicidal, 321, 322.
Occlusion of cerebral vessels, 408.
Occupation, 1, 15, 212, 227, 356, 400, 436.
Occupation delirium, 211, 343.
Occupation dreams, 337, 415.
Occupation, therapeutic, 114, 261.
Oculo-motor paralysis, 438.
Œdema, 234, 360, 423, 430.
Œdipus legend, 132.
Olfactory hallucinations, *see* Hallucinations, olfactory.
Oliguria, 234, 430.
Omens, 126.
Onanism, *see* Masturbation.
Onomatomania, 321.
Onset of psychoses, 54, 58, 79, 80, 231, 234, 236, 237, 251, 255, 262, 277, 378, 389, 423, 427, 434, 444.
Operations, surgical, *see* Surgical operations.
Ophthalmoplegia, 376.
Ophthalmoscopic examination, 81.
Opium, 8, 194, 355, 357, 626, 633.
  in excitement, 105.
  in involutional melancholia, 299.
Opposites test, 621, 623.
Optic nerve atrophy, 360, 383.
Optic neuritis, 438.
Optimism, 68, 269, 371.
Organic cerebral affections, 437–442, 470, 631, 632, 637.
Organic crises, 378.
Organic psychoses, 139, 194.

Orgasm, premature, 319.
Orientation, 40, 83, 230, 268, 273, 329, 349, 359, 373, 380, 389, 628, 631, 636. *See also* Disorientation.
Orientation, allopsychic, 40, 342, 424.
  autopsychic, 40, 211, 252, 342, 424.
  of personality, 40.
  of place, 40, 353, 366, 415.
  of time, 40, 199, 291, 353, 366, 415, 424.
Otitis media, 30, 438.
Outdoor life, 213.
Out-patient clinics, 119, 147, 153, 155.
Over-determination, 136.
Overseers of the poor, 191.
Overwork, 119, 256, 257, 443, 634.

Pachymeningitis hemorrhagica interna, 330, 392.
Pack, wet, 104.
Pain, 65, 80, 309, 318, 353, 371, 417.
Pain, psychic, *see* Psychic pain.
Painful hallucinations, *see* Hallucinations, painful.
Pallor, 63, 65, 80, 207, 295, 360, 361.
Palpitation, 295, 435, 638.
Pandy's phenol test, 89, 391, 459.
Panophobia, 320, 323.
Paræsthesia, 344, 353, 411, 638.
Paraldehyde, 106, 348.
Paralysis agitans, 626, 632.
Paralysis, 121, 203, 300, 303, 307, 309, 312, 323, 331, 332, 333, 364, 381, 382, 385, 410, 411, 418, 629.
  brachial, 409.
  facial, 344, 366, 381, 409.
  oculo-motor, 438.
  of attention, 48.
Paralysis of the will, 70.
  psychic, xiii, 49, 67, 70, 286, 287, 295, 424, 426, 431.
  psychomotor, 66.
Paralytic dementia, 370.
Paranoia, 6, 28, 52, 58, 193, 218, 229, 244, 260, 262–266, 327, 350, 448, 627, 637, 639.
Paranoia litigans, 265.
Paranoia originaire, 60, 262.
Paranoia querulens, 265.
Paranoiacs, amorous, 265.
  filial, 265.
  hypochondriacal, 265.
  -inventors, 265.
  jealous, 265.
  -mystics, 265.
Paranoid dementia, 229, 244, 246, 255, 266.
Paranoid personality, 216, 218.
Paranoid state, presenile, 447, 625, 629.
Paraphasia, 344, 473.
"Parasyphilitic" disorders, 396.
Parenchymatous neuro-syphilis, *see* General paralysis.
Parental alcoholism, 195, 196.
Parental authority, 124.
Parental syphilis, 196.
Paresis, *see* General paralysis.
Parole, 77, 117, 154, 173, 187, 188.
Partial dissociation, 552.
Particles of speech, 549, 551, 552.
Part-whole test, 621, 624.
Passivity, 57, 81.
Patellar reflex, *see* Knee jerks.
Pathological anatomy, 334, 338, 339, 346, 365, 367, 392–394, 409, 410, 427, 439, 448.
Pathological drunkenness, *see* Drunkenness.
Pathological lying, 216, 221, 269, 317.
Pathological reactions, 548, 549, 552.

Pathological suggestibility, *see* Suggestibility.
Pauperism, 78, 177, 190. *See also* Dependency.
Pederasty, 226.
Pellagra, 441, 626, 633.
Penal institutions, v, 78, 186, 187, 192, 212, 220.
Penitentiaries, 186.
Perception, 19, 67, 70, 85, 98, 237, 238, 239, 277, 373, 444.
  imaginary, *see* Hallucinations.
  inaccurate, *see* Illusions.
  insufficiency of, 19, 20, 49, 278, 286, 287, 332, 422, 424.
Periencephalo-meningitis, 370.
Periodic psychoses, 283, 284.
Peripheral hallucinations, 29, 30.
Peripheral nerve lesions, 394.
Perivascular gliosis, 407.
Perivascular infiltration, 367, 393.
Perplexity, 257, 441.
Persecution, ideas of, *see* Ideas of persecution.
Perseverance, 216, 221.
Perseveration, 329, 550, 552.
Personal history, *see* History, personal.
Personality, 40, 74, 84, 95, 97, 262, 301, 342, 366, 631, 638, 639.
  autistic or shut-in, 255, 259, 285, 636.
  disaggregation of, 37, 54, 245.
  disorders of, 35, 37, 73–75, 215.
  doubling of, 301.
  epileptic, 205.
  hysterical, 303, 312, 316, 317.
  inadequate, 216, 258.
  of physician, 113.
  orientation of, 40.
  paranoid, 216, 218.
  reduplication of, 58, 74, 75, 320.
  shut-in or autistic, 255, 259, 285, 636.
  splitting of, 301, 315.
Personality, transformation of, 74, 75, 249, 250, 255, 320, 425.
Perspiration, 361, 426, 435, 436, 638.
Persuasion, 303, 310, 311.
Perversion of psychic functions, xiii.
Perversion of the will, 73.
Perversion, sexual, 78, 79, 122, 124, 223, 224, 639.
Pessimism, 249, 269, 277, 285, 292, 371.
Phantasy thinking, 137–139.
Pharmaco-psychology, experimental, 99.
Phenol test, Pandy's, 89, 391, 459.
Phlegmons, 361.
Phobias, 121, 127, 322, 323, 638.
  mechanisms of, 127.
Phonemes, 31, 34, 249.
Physical causes, 10, 78, 303, 304.
Physical examination, 80, 140, 202.
Physician, personality of, 113.
Physician's certificate of insanity, 102.
Physiognomy, 196, 238, 280, 432. *See also* Expression, facial.
Pia-arachnoid, lesions of, 365, 392, 393.
Pial infiltration, 367, 393.
Picric acid, 403.
Pimps, 357.
Pithiatism, 302.
Pituitary gland, 634.
Planlessness, 216.
Plantar reflex, 81, 337, 366, 382, 388, 441.
Plaques, miliary, 448.
Plasma cells, 367, 393.
Plea of insanity, 185.
Pleasing hallucinations, *see* Hallucinations, pleasing.
Pledge of abstinence, 114.
Pleocytosis, 89, 367, 368, 390. *See also* Cell count.

Pneumococcus infection, 346.
Pneumonia, 214, 276, 299, 345, 347, 354, 385, 394, 403, 427, 430, 448.
Point scale of intelligence, 96.
Police, 188, 191, 192, 215.
Pollution, sexual, 122.
Polyneuritic psychosis, 7, 43, 47, 194, 342, 351–354, 626, 632, 633, 634.
  course, 354.
  diagnosis, 354.
  etiology, 351.
  prognosis, 354.
  symptoms, 351–353.
  treatment, 354.
Polyneuritis, 338, 351, 352, 353, 354, 632.
Polyuria, 68, 234, 378, 430.
Pons, lesions of, 409.
Poorhouse, 203.
Possession, ideas of, *see* Ideas of possession.
Post-epileptic stupor, 207, 210.
Posterior cerebral artery, 409.
Post-febrile psychoses, 634.
Post-infectious psychoses, 634, 635.
Post mortem, *see* Autopsy.
Post-traumatic mental enfeeblement, 625, 628. *See also* Traumatic dementia.
Poverty, 119, 146, 216.
Predisposition, neuropathic, 9, 118, 331, 340.
Pregnancy, 10, 256, 285.
Premature birth, 78.
Premature orgasm, 319.
Premature senility, 443.
Premeditation, 26.
Presbyophrenic type of senile dementia, 625, 628.
Presenile paranoid state, 447, 625, 629.
Presentiments, 67, 371.
Pressure sores, 384, 390, 402.
Prevalence of mental disorders, 17, 18, 160, 180, 190.
Prevention of epilepsy, 212.
Prevention of mental disorders, 159, 165, 180, 401.
Prevention of recurrencies, 118, 119, 154, 289.
Previous attacks, 76, 80.
Primary mental confusion, *see* Mental confusion.
Primary syphilis, 365, 396, 401.
Prisons, 186, 192, 220.
Probability integral, 93.
Probable Error, 93, 94.
Prodromata, 236, 243, 245, 267, 277, 289, 292, 342, 348, 370, 371, 422.
Profane language, 271.
Prognosis, 28, 33, 35, 37, 44, 54, 59, 76, 86, 158, 202, 245, 251, 252, 253, 266, 276, 280, 282, 284, 294, 298, 338, 344, 345, 350, 354, 361, 363, 369, 389, 390, 412, 421, 426, 430, 448.
Progressive amnesia, *see* Amnesia, progressive.
Prohibition, 175, 176.
Projection centers, lesions of, 386.
Prolixity, 271, 281.
Prophylaxis in psychiatry, 118, 119, 154, 159, 165–180, 212, 257, 401.
Prophylaxis of syphilis, 168, 178.
Propriety, sense of, 269.
Prostitution, 78, 79, 168, 186, 200, 215, 224, 357, 401.
Prostitution and mental defect, 168–170, 185.
Prostitution, control of, 168.
Prostration, 361, 423, 634.
Prudent morality, 316, 317.
Pseudo-hermaphroditism, 226.
Pseudologia phantastica, 221.
Pseudo-reminiscences, 47, 272, 352, 354, 381, 416, 445.

Psychasthenia, 77, 258, 319–326, 371, 627, 638.
Psychiatric social worker, 149-150.
in courts, 150.
in industries, 150.
in reformatories, 150.
in schools, 150.
in social agencies, 150.
practice work, 149.
qualifications, 149.
training, 149.
Psychiatric statistics, *see* Statistics, psychiatric.
Psychiatry, xiii.
Psychic catharsis, 145.
Psychic causes, 10, 303, 304.
Psychic determinism, 120.
Psychic disaggregation, *see* Disaggregation, psychic.
Psychic functions, perversion of, xiii.
Psychic hallucinations, *see* Hallucinations, psychic.
Psychic infirmity, xiii, xiv, 11.
Psychic inhibition, *see* Inhibition, psychic.
Psychic interference, 73.
Psychic make-up, *see* Make-up, psychic; *also* Personality.
Psychic mechanisms, *see* Mechanisms.
Psychic pain, 58, 63, 65, 66, 67, 108, 236, 278, 280, 286, 292, 293, 295, 297, 298, 299, 388, 447, 448. *See also* Depression *and* Sadness.
Psychic paralysis, *see* Paralysis, psychic.
Psychoanalysis, 117, 120–145, 306.
technique of, 98, 128, 139–145.
Psychogenic factors, 100.
Psychogenic disorders, 85.
Psychological group tests, 97, 621–624.
Psychological research, 95, 96.
Psychology, applications of, 92.
differential, 100.
educational, 99.
Psychometry, 287, 373, 431, 444, 639. *See also* Measurements, mental.
Psychomotor paralysis, 66.
Psychoneuroses, 6, 11, 12, 77, 113, 117, 124, 132, 139, 141, 145, 192, 193, 215, 216, 300–326, 357, 627, 637, 638, 639.
Psychopathic states, *see* Constitutional psychopathic states; *also* Constitutional inferiority.
Psychopathic wards in general hospitals, 181.
Psychopathology, experimental, 99.
Psychopathology of everyday life, 124.
Psychopathy, sexual, 216, 223–227.
Psycho-sensory disorders, *see* Hallucinations *and* Illusions.
Psychoses, xiii.
Psychotherapy, 112–117, 120, 140, 147, 201, 266, 281.
Ptosis, 337, 366.
Puberty, 122, 124, 229, 256, 435.
Puerilism, 437.
Puerperal state, 427.
Pulse, 63, 65, 69, 80, 81, 234, 271, 276, 278, 295, 332, 345, 361, 385, 408, 423, 426, 432, 433, 436, 438, 631.
Punishment, 183.
deterrent effect of, 183, 187, 219.
Pupils, examination of, 81.
in cerebral syphilis, 366.
in chronic alcoholism, 337.
in dementia præcox, 233.
in depression, 65, 295.
in general paralysis, 372, 376–377, 381.

Pupils, in morphine addiction, 360.
in primary mental confusion, 426.
in senile dementia, 446.
in uræmic delirium, 430.
Pure morality, 316, 317.
Purgatives, 430.
Pyramidal tract, lesions of 382.
Pyromania, 187, 321.
Pyrosis, 338.

Quantitative methods, 92, 98.
Quarreling, 235, 351.

Race, 1, 12, 355, 356.
Rambling speech, 82, 269, 273.
Rape, 223, 383, 387, 389, 445.
Rapport, 114, 140, 477.
Raptus melancholicus, 295.
Rational thinking, 137–139.
Reactions, 25, 26, 41, 55, 65, 66, 70–73, 230, 231, 232, 236, 237, 241, 244, 245, 248, 251, 255, 257, 263, 270, 278, 295, 296, 298, 359, 363, 374, 380, 424, 429, 447.
automatic, 66, 67, 68, 70, 72, 208, 232, 296, 445.
automatic, negative, 71.
automatic, positive, 71.
common, 548, 551, 552, 553.
contrary, 73.
doubtful, 548, 551, 552, 553.
impulsive, 26, 41, 68, 71, 102, 205, 236, 254, 267, 270, 288, 332, 374, 447.
individual, 98, 548, 549, 551, 552, 553.
motor, 68.
non-specific, 548, 551, 552, 553.
normal, 548, 549, 551, 552, 603.
pathological, 548, 549, 552.
sound, 549, 551, 552.
specific, 551, 552, 553.
Reactions, unclassified, 550, 551, 552.
violent, *see* Violent reactions.
voluntary, 70, 231, 238.
Reaction time, 49, 99, 548.
Reaction types, 257, 259, 301, 547.
Reactivation of immune serum, 460.
Reading tests, 85, 375.
Re-admissions to institutions, 118.
Realistic thinking, 137–139.
Reasoning insanity, *see* Paranoia.
Recessive condition, 3, 5, 327.
Recovery, 64, 114, 118, 154, 158, 159, 201, 202, 242, 252, 253, 255, 267, 268, 271, 273, 276, 280, 281, 290, 291, 293, 294, 298, 305, 306, 308, 345, 350, 354, 363, 365, 368, 369, 390, 409, 412, 414, 426, 436, 640.
Recruits, military, 97, 192, 216, 347, 436.
Rectal feeding, 214.
Rectal medication, 105, 106, 214, 404.
Recurrency, 103, 118, 159, 201, 252, 267, 282, 286, 289, 305, 350, 363, 635.
prevention of, 118, 119, 154, 289.
Recurrent depression, 283.
Recurrent mania, 283.
Recurrent psychoses, 54, 62, 201, 267.
Recurrent vomiting, 78.
Reduplication of personality, 58, 74, 75, 320.
Re-education, 99, 114, 312.
Reference, ideas of, 258, 636.
Reflex hallucinations, 29.
Reflexes, 432.
cutaneous, 337, 344, 382.
plantar, 81, 337, 366, 382, 388, 441.
pupillary, 81, 233, 300, 366, 376, 377.

Reflexes, tendon, 81, 233, 279, 300, 337, 344, 353, 360, 366, 382, 388, 441, 446, 630.
Reformatories, 150, 185, 212.
Refractory hysterics, 308, 311, 312, 317.
Refusal of food, 35, 58, 66, 101, 109–112, 238, 241, 243, 261, 298, 349, 388, 402, 428, 441.
  absolute, 109.
  complete, 109.
  partial, 109.
  relative, 109.
  treatment, 109–112.
Religious influences, 114.
Religious preoccupation, 78, 79.
Religious scruples, 322, 323.
Remissions, 118, 252, 253, 254, 276, 280, 286, 377, 382, 386, 387, 390, 432, 448.
Remorse, 221.
Renal lesions, *see* Albuminuria, Kidney lesions, *and* Nephritis.
Repetition of thought, 32.
Repressed wish, 128, 130, 315, 638.
Repression, 121, 122, 123, 124, 127, 128, 131, 301, 302.
Reproduction, amnesia of, *see* Amnesia of reproduction.
Research, psychological, 95, 96.
  sociological, 150, 154.
Resignation, 63.
Resistance, psychic, 140, 142, 144.
Resistiveness, 81, 241, 243, 629.
Respect, 140.
Respiration, 80, 271, 294, 295, 361, 385, 426, 433.
  in anger, 67.
  in depression, 64, 65.
  in euphoria or joy, 69.
Responsibility, criminal, xiv, 181, 183–185.
  legal conception of, 183.
  scientific conception of, 184.
Rest in bed, 103, 105, 109, 276, 281, 299, 307, 347, 354; 412, 428, 436.
Restlessness, 104, 337, 360, 367, 414, 420, 435, 438, 441, 628, 635. *See also* Excitement.
Restraint, mechanical, 103, 347.
Restriction of marriage, 171.
Retardation in school, 77, 79, 148, 191, 192, 303.
Retardation, psychomotor, 92, 99, 319, 635.
Retention, 354, 628, 629, 632. *See also* Memory.
Retention tests, 84.
Reticence, 27, 259.
Retribution, 183, 184.
Retrobulbar neuritis, 337.
Retrograde amnesia, *see* Amnesia, retrograde.
Retrogressive amnesia, 44.
Retrospective falsifications, 54. *See also* Fabrications, Hallucinations of memory, Illusions of memory, *and* Pseudo-reminiscences.
Revenge, 183.
Reverses in business, 10, 79.
Rigidity, muscular, 388, 441.
Romberg sign, 81, 388.
Ross-Jones ammonium sulphate test, 89, 391, 459.
Ruin, ideas of, *see* Ideas of ruin.
Rural environment, 14, 401.

Sadism, 224, 225.
Sadness, 25, 58, 66, 197, 277, 278, 282, 293, 294, 298, 324, 635. *See also* Depression *and* Psychic pain.
Saline injections, 428.
Saliva, 68, 234.
Salvarsan, 365, 368.
Sanatorium, 78, 297, 324. *See also* Institutions.

Sanitary menace, 215.
Scanning speech, 81.
Scaphocephaly, 197.
Schizophrenia, 260, 636, 639.
Schools, v, 97, 150, 192, 202, 203.
  mental cases in, *see* Retardation in school.
Sclerosis, combined, 382, 394.
  multiple, *see* Multiple sclerosis.
Scotoma, central, 337.
Scruples, 221, 269, 270.
  moral, 323.
  religious, 322, 323.
Seclusion, *see* Isolation.
Seclusiveness, 79, 259, 319, 636.
Secondary syphilis, 364, 399.
Sedatives, 105–107, 307, 348.
Seduction, 122.
Segregation, 164, 171–174, 184, 202, 203, 204, 212.
  obstacles to, 173.
  safeguards in, 173.
  selection for, 172.
Seizures, apoplectiform, *see* Apoplectiform seizures.
  epileptiform, *see* Epileptiform seizures.
  hysteriform, *see* Hysteriform seizures.
Sejunction, 39.
Self-absorption, 319.
Self-accusation, ideas of, *see* Ideas of self-accusation.
Selfishness, 61, 205, 220, 316, 328.
Self-mutilations, 108.
Self-observation, 141, 142.
Seminal emissions, 319.
Senile delirium, 447, 625, 629.
Senile dementia, xiv, 13, 44, 45, 46, 56, 61, 102, 269, 338, 345, 346, 372, 391, 411, 425, 443–448, 633.
  course, 448.
  diagnosis, 449.
  etiology, 443.
Senile dementia, presbyophrenic type, 625, 628.
  prognosis, 448.
  symptoms, 444–447.
  treatment, 448.
Senile epilepsy, 447.
Senile psychoses, 12, 194, 625, 628.
Senility, 369, 443.
  premature, 443.
Senium præcox, 443.
Sensitiveness, 63, 259, 296.
Sensory aphasia, 409.
Septicemia, 634.
Serological tests, 79.
Serum, immune, 460.
  inactivation of, 460.
  reactivation of, 460.
Sex, 1, 7, 9, 14, 15, 16, 121, 186, 203, 300, 315, 319, 328, 400, 441.
  development of, 122–124.
  immorality, 2, 148, 186, 191, 197.
  physical, 226.
  psychic, 226.
  theory of, 121.
Sexual aim, 121, 123, 124.
  anæsthesia, 124.
  anomalies, 78, 79, 215.
  complexes, 121, 135, 302.
  end-pleasure, 122.
  fore-pleasure, 122, 124.
  frigidity, 124, 223, 224.
  inversion, 78, 79, 223, 224, 226.
  latency, period of, 122, 123.
  life, 76, 79, 179.
  maladjustment, 121.
  material, in dreams, 130, 133.
  neurasthenia, 318, 319.
  object, 121, 123, 124.
  perversion, 78, 79, 122, 124, 223, 224, 639.
  pollution, 122.
  psychopathy, 216, 223–227.
  tension, 122.
Sexuality, adult, 122.
  infantile 121, 122, 124, 314.

Shame, 122, 269.
"Shell shock," 305.
Shiftlessness, 216.
Shirking, 258, 315, 317.
Shortness of breath, 435.
Short or cortical arterioles, 405, 407, 408.
Shrines, 114.
Shut-in personality, *see* Personality, shut-in.
Shyness, 259.
Sick headache, 78, 303.
Silliness, 631, 636, 637.
Similar heredity, 2, 78, 285, 327.
Simplex inheritance, 4.
Simulation, 300, 303, 307, 308, 313, 318, 417. *See also* Malingering.
Sitiophobia, *see* Refusal of food.
Skin lesions, 432, 446.
Skull, fractures of, 79, 413, 628.
  malformations, 80, 197.
Slang, 359.
Sleep, 40, 80, 129, 130, 210, 271, 275, 279, 328, 331, 332, 333, 337, 342, 345, 348, 350, 415, 423, 426, 431, 446. *See also* Insomnia.
Sleeplessness, *see* Insomnia.
Slips of speech, writing, or conduct, 124.
Slit-like defects in cerebral arteriosclerosis, 410.
Slouchy bearing, 277.
Slurring speech, 81.
Small-pox, 421, 634.
Smell, hallucinations of, *see* Hallucinations, olfactory.
Smoking, 356, 357.
Snuffing, 357.
Sociability, 79.
Social activities, 124.
Social case work, 153, 155.
Social factors, 153, 339, 340.
Social history, 150, 202.
Social maladjustment, 145, 146, 148, 156, 190, 191, 197, 200, 215, 303, 639.
Social re-adjustment, 147, 148.
Social work, 77, 146–157, 212, 217, 222.
Social worker, psychiatric, *see* Psychiatric social worker.
Sociological classification, 191.
Sociological department, 119.
  functions of, 150.
  organization of, 155.
Sociology, applied, 146–157.
Softening, cerebral, 391, 408, 629.
Somatic disorders, 65, 67, 119, 233.
Somnal, 106.
Somnambulism, 207.
Somnolence, 318, 342, 414, 431, 446, 631.
Sound reactions, 549, 551, 552.
Spastic form of general paralysis, 388.
Special diagnostic procedures, 88–91, 202, 449–624.
Specific reactions, 551, 552, 553.
Speech disorders, 81, 85, 328, 344, 372, 375, 377, 381, 441.
Speech tests, 81, 375.
Sphincter control, 81, 197, 390, 402.
Spider cells, 394.
Spinal cord lesions, 384, 394.
Spinal forms of general paralysis, 388.
Spinal puncture, *see* Lumbar puncture.
Spirochete, 365. *See also Treponema pollidum.*
Splanchnic neurasthenia, 318
Splitting of personality, 301, 315.
Spontaneous utterances, 81, 471.
Spoon feeding, 110.
Sprees, 79.
Staggering gait, 438.

Stammering, 376.
Stanford revision of Binet-Simon scale, 96, 198, 476–546.
Statistics, psychiatric, 2, 6, 8, 9, 10, 12, 13, 14, 15, 16, 17, 87, 118, 158, 160, 166, 185, 186, 187, 191, 192, 212, 216, 255, 285, 294, 397, 400, 401, 413, 443.
Stature, 259, 434.
Status epilepticus, 214.
Stealing, 228, 269, 336.
Stenographic record, 82.
Stereotypy, 71, 72, 85, 237, 238, 243, 258, 261, 374, 637.
  of attitudes, 72, 232, 238, 242, 254.
  of language, *see* Verbigeration.
  of movements, 72, 232, 236, 254.
Sterilization, 171.
Stigmata of degeneration, anatomical, 197.
Stock of ideas, 235, 335, 432, 445.
Strabismus, 81, 337, 345, 366, 372, 474.
Stress, 11, 17, 292, 341, 427, 436.
Stroke, 408.
Strophanthus, 362.
Strychnin, 214, 348.
Stubbornness, 205, 218, 259.
Stupor, 40, 50, 70, 74, 81, 82, 240, 243, 253, 280, 292, 295, 414, 416, 429, 430, 442, 627, 634, 635, 637, 638.
  catatonic, *see* Catatonic stupor.
  depressive, 74, 277, 280.
  manic, 281, 627, 635.
  post epileptic, 207, 210.
Stuporous melancholia, 294, 295.
Stuporous mental confusion, 20, 423, 426.
Stuttering, 81, 309, 344.
Subconscious complexes, *see* Complexes, subconscious.
Subjective complaints, 80.
Sublimation, 122, 124.
Substitution, 137, 257, 258.
Suffocation, 261, 376.
Suggestibility, 71, 232, 238, 239, 241, 253, 274, 303, 312, 446, 629, 632.
Suggestion, 30, 108, 112–117, 201, 281, 303, 312, 340, 344, 352.
Suicidal obsession, 321, 322.
Suicidal tendencies, 58, 66, 77, 101, 102, 105, 107–109, 208, 237, 240, 243, 281, 295, 297, 298, 299, 319, 329, 333, 367, 371, 388, 402, 427, 441, 447.
  due to delusion, 108.
  due to disgust for existence, 108.
  due to fixed idea, 108.
  due to hallucination, 108.
  due to impulse, 108.
  due to psychic pain, 108.
  due to suggestion, 108.
Suicide, epidemics of, 108.
  familial, 108, 296, 322.
  methods of, 108, 297.
  prevention of, 159.
  weapons of, 108.
Sulkiness, 431.
Sulphonal, 106.
Summary, clinical, 86.
Superficiality, 319.
Supervision, 103, 105, 109, 173, 202, 203, 204, 298, 299.
Suppuration, 347.
Surface of frequency, 94.
Surgical operations, 79, 91, 414, 436, 438, 441.
Surveys of mental disorders, 148, 190.
Suspiciousness, 82, 201, 218, 249, 258, 262, 263, 349, 447, 628, 631, 633, 634, 636, 637.
Swindling, 359, 387.

Symbolic reactions, 80.
Symbolism, in dreams, 131, 133, 134, 135, 144.
  in folk lore, 133.
  in legends, 133.
  in manners of speech, 133.
  in myths, 133.
  in proverbial sayings, 133.
  in wit, 133.
  sexual, 134, 135, 225.
Sympathy, *see Rapport, and* Transference.
Symptoms of abstinence, 347, 356, 360, 361.
Syncope, 104.
Syphilis, 2, 8, 13, 14, 79, 88, 165, 166, 168, 170, 174, 177, 364–412.
  cerebral, *see* Cerebral syphilis.
  congenital or hereditary, 78, 168, 178, 196, 400.
  primary, 365, 396, 401.
  prophylaxis of, 168, 178.
  secondary, 364, 399.
  tertiary, 399.
Syphilitic disorders, 194, 364–412, 630, 631.
Systematized delusional states, *see* Delusions, systematized.

Tabes, 338, 377, 388, 391, 394, 399, 400, 402, 457, 626, 632.
Tabetic form of general paralysis, 388, 394, 630.
Tachycardia, 435, 436.
Taciturnity, 81, 220.
Tactile hallucinations, 35, 363.
Tactlessness, 216.
Tædium vitæ, 108, 371.
Tantrums, 257.
Tapping test, 93.
Taste, hallucinations of, *see* Hallucinations, gustatory.
Teasing, 269.
Teeth, 91, 435.
Temperamental anomalies, 2, 78, 79, 90, 200, 202, 215, 303, 639.
Temperance, 175, 234, 336.
Temperature, 80, 279, 300, 344, 345, 360, 385, 419, 423, 426, 438, 634.
Temporizing, 257.
Tenacity, 205.
Tendon reflexes, *see* Reflexes, tendon.
Tension, mental, 629.
Tension, sexual, 122.
Terminal brain arterioles, 405, 407, 408, 409.
Tertiary syphilis, 399.
Testamentary capacity, xiv, 181, 182, 183.
Test, ammonium sulphate, Ross-Jones', 89, 391, 459.
  butyric acid, Noguchi's, 89, 391, 459.
  cancelling A, 621, 623.
  colloidal gold, Lange's, 89, 368, 391, 452, 455–458.
  completion, Trabue's, 621, 623.
  digit span, 621, 622.
  Kent-Rosanoff, 547–620.
  logical memory, 621, 622.
  opposites, 621, 623.
  part-whole, 621, 624.
  phenol, Pandy's, 89, 391, 459.
  word building, 621, 624.
Tests, association, 90, 97, 98, 547–620.
  Binet-Simon, *see* Binet-Simon tests.
  chemical, 89, 455–459.
  group, 97, 621–624.
  intelligence, 90, 96.
  psychological, 88, 201, 476–624.
  reading, 85, 375.
  retention, 84.
  serological, 79.
  speech, 81, 375.
  writing, 81, 85.

Tetronal, 106.
Therapeutic diversion, 261.
Therapeutic occupation, 114, 261.
Therapeutics, 139, 257, 258. *See also* Psychotherapy *and* Treatment.
Therapeutics, educational, 99.
Thieves, 203.
Thinking, autistic, 137–139, 636.
 common sense, 137–139.
 directed, 137–139.
 dream, 135–139.
 logical, 137–139.
 phantasy, 137–139.
 rational, 137–139.
 two kinds of, 137–139.
 unconscious, 133.
Thought, echo of, 245, 250.
 escape of, 37.
 flow of, 81, 91, 98. *See also* Distractibility, Disconnectedness, Flight of ideas, *and* Incoherence.
 repetition of, 32.
 stealing of, 32, 245.
Thought process, characteristics of, 199.
Threats, 25.
Throat, abnormalities of, 91.
Thrombosis, 408.
Thymus gland, 634.
Thyrogenic psychoses, 194, 431–436, 634, 635.
Thyroidectomy, 436.
Thyroid gland, 431–436.
Thyroid medication, 433, 435.
Thyroidine, 433.
Timidity, 268, 323, 477, 479.
Tinnitus aurium, 382.
Tired feeling, 277.
Tobacco, 355, 356.
Torpor, mental, 419, 431, 433, 437.
Total mental content, 120.
Touch, hallucinations of, 35, 363.
Touchiness, 201.
Toxic delirium, 36, 68, 419, 429.
Toxic psychoses, 21, 29, 35, 44, 55.
Trabue's completion test, 621, 623.
Training, 99, 114, 202, 203, 204, 212, 258.
Tramp life, 227, 639.
Transference, 121, 136, 140.
Transformation of personality, *see* Personality, transformation of.
Transition forms of psychoses, 100, 260, 636.
Transitory delirium, 211.
Transitory mania, 211.
Traumatic constitution, 9, 194, 416, 417, 418, 625, 628.
 delirium, 9, 194, 414–416, 625, 628.
 dementia, 9, 194, 418, 628.
 disorders, 9, 194, 413–418.
 epilepsy, 9, 194, 417, 418, 628.
 hysteria, 301, 308.
 neuroses, 315.
Traumatism, 78, 256, 257, 308, 384, 413, 417, 427, 430, 443, 628, 633. *See also* Head injury.
Treatment, 76, 80, 86, 91, 118, 139, 147, 150, 153, 159, 173, 202, 212, 261, 266, 276, 281, 282, 289, 299, 306, 308, 334, 341, 350, 354, 361, 363, 368, 402, 412, 414, 421, 428, 430, 432, 433, 435, 436, 448. *See also* Psychotherapy *and* Therapeutics.
 of excitement, 103.
 of mental disorders, 101.
 of refusal of food, 109–112.
 of suicidal tendency, 107–109.
Tremors, 65, 68, 81, 86, 121, 295, 300, 309, 337, 344, 360, 374, 382, 411, 435, 436, 446, 448, 632, 638.

Tremors, coarse, 81, 375, 376.
fibrillary, 375.
fine, 81.
intention, 81.
Treponema pallidum, 396, 398, 399, 401, 461.
Trional, 106, 436.
Trophic disorders, 379, 383.
Truancy, 148, 191.
Tube feeding, 110–112, 241, 298.
by the mouth, 110.
by the nose, 111.
Tuberculosis, 68, 69, 91, 196, 252, 299, 341, 354, 361, 385, 394, 427, 433.
Tumor, brain, *see* Brain tumor.
Twitching, muscular, 318, 375, 441.
Typhoid fever, 346, 421, 427, 634.
Typhus fever, 421.
Typical, 93.
Tyrannical tendency, 445.

Uncertainty, 20, 24, 278, 287, 323, 424.
Unclassified reactions, 550, 551, 552.
Unconscious motives, 121, 314.
Unconscious, realm of the, 120, 121, 126, 140, 300.
Unconscious thinking, 133.
Unconscious wish, 130, 131.
Unconsciousness, 40, 41, 42, 79, 206, 208, 414, 415.
Undercurrent, 257.
Undernutrition, 318, 634.
Undesired idea, 142.
Uneasiness, 249, 282, 297, 324, 342, 349, 420, 635.
Unemployment, 10, 216.
Ungraded classes, 192, 202.
Unilateral hallucinations, 29.
Unit characters, 3.
Unpleasant hallucinations, *see* Hallucinations, painful or unpleasant.
Unreliability, 125.
Unrequited love, 11.
Unrestrained persons, 397.
Unruly children, 148, 191, 202.
Untidy appearance, 81, 243.
Uræmic delirium, 429–430.
Urban environment, 14, 17, 401.
Urine, 64, 65, 69, 81, 234, 294, 350, 377, 378, 423, 430. *See also* Albuminuria.
Uterine displacements, 318.
Utterances, spontaneous, 81.

Vagina, 122.
Vagrancy, 78, 79, 148, 197, 200, 203, 215.
Vanity, 262.
Variola, 421, 634.
Vasomotor disorders, 63, 64, 67, 69, 234, 388, 628.
Vaso-paralytic lesions, 395.
Vegatative functions, 73.
Venereal history, 76, 79.
Vengeance, 53.
Ventricles, brain, 410.
Verbal auditory hallucinations, 31, 53, 58, 249.
Verbigeration, 72, 82, 232, 236, 237, 240, 242, 254.
Vertigo, 80, 337, 409, 416, 433, 438.
epileptic, 206.
Vice, 185, 190.
Violence, 42, 220, 359, 389.
Violent reactions, 25, 26, 62, 67, 81, 102, 243, 266, 295, 350, 363, 387, 429, 637.
Visceral disorders, 346, 379, 385, 394, 432.
Visceroptosis, 318.
Visions, 33, 343, 349.
Visual hallucinations, *see* Hallucitions, visual.
Vital sense, 73, 74.

Voices, 25, 28, 32, 33, 83, 108, 109, 297. *See also* Hallucinations, auditory.
Volubility, 271, 332, 380.
Voluntary commitment, 181, 322.
Voluntary reactions, 70, 231, 238.
Vomiting, 78, 112, 318, 361, 366, 385, 409, 438, 452, 631, 638.
Voracious appetite, 446.

Wandering impulse, 227.
Warm baths, 104, 105, 299.
War neuroses, 303, 304.
Wassermann reaction, 89, 178, 364, 367, 391, 396, 401, 411, 438, 451, 452, 460–469, 630.
collecting specimens for, 467.
principle of, 460.
reagents for, 462.
technique of, 468.
Wasting in melancholia, 298.
Watching, 109, 281, 299, 421.
Waxy flexibility, 71, 73.
Weakness, muscular, *see* Muscular weakness.
Weapons, suicidal, 108.
Weight, 64, 69, 80, 110, 234, 235, 241, 271, 276, 279, 280, 294, 324, 360, 361, 377, 378, 381, 423.
Wet pack, 104.
Whooping cough, 78.
Will, 25, 26, 28, 52, 70, 71, 72, 203, 220, 229, 232, 236, 238, 256, 300, 336, 342, 424.
Will, freedom of, xiv, 183, 184.
paralysis of, 70, 73.
perversion of, 73.
Wish, 120, 128, 130, 137.
erotic, 130.
-fulfilment, 128, 129, 130, 138.
repressed, 128, 130, 315, 638.
unconscious, 130, 131.
Wit, 133.
Withdrawal of alcohol, 347, 348, 350, 633.
Withdrawal of habit forming drugs, 361, 362.
Witnesses, expert, 183.
Word building test, 621, 624.
Word complements, 549, 551, 552.
Work, capacity for, 50, 268, 335, 373, 408, 417, 633.
Workhouses, 186.
World War, v, 11, 12, 192, 216, 218, 300, 304, 318, 347, 436.
Worms, intestinal, 91.
Worrisome disposition, 78, 79, 285.
Worry, 326, 412, 436, 635.
Writing, automatic, 37.
Writing mediums, 37.
Writing tests, 81, 85.

Yawning, 361.
Yerkes-Bridges tests, 96.

Zoopsia, 337.



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